

Stellar laboratories

VIII. New Zr IV – VII, Xe IV – V, and Xe VII oscillator strengths and the Al, Zr, and Xe abundances in the hot white dwarfs G191–B2B and RE 0503–289^{*,***,***}

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ABSTRACT

Context. For the spectral analysis of high-resolution and high-signal-to-noise spectra of hot stars, state-of-the-art non-local thermodynamic equilibrium (NLTE) model atmospheres are mandatory. These are strongly dependent on the reliability of the atomic data that is used for their calculation.

Aims. To search for zirconium and xenon lines in the ultraviolet (UV) spectra of G191–B2B and RE 0503–289, new Zr IV–VII, Xe IV–V, and Xe VII oscillator strengths were calculated. This allows, for the first time, determination of the Zr abundance in white dwarf (WD) stars and improvement of the Xe abundance determinations.

Methods. We calculated Zr IV–VII, Xe IV–V, and Xe VII oscillator strengths to consider radiative and collisional bound-bound transitions of Zr and Xe in our NLTE stellar-atmosphere models for the analysis of their lines exhibited in UV observations of the hot WDs G191–B2B and RE 0503–289.

Results. We identified one new Zr IV, 14 new Zr V, and ten new Zr VI lines in the spectrum of RE 0503–289. Zr was detected for the first time in a WD. We measured a Zr abundance of -3.5 ± 0.2 (logarithmic mass fraction, approx. 11 500 times solar). We identified five new Xe VI lines and determined a Xe abundance of -3.9 ± 0.2 (approx. 7 500 times solar). We determined a preliminary photospheric Al abundance of -4.3 ± 0.2 (solar) in RE 0503–289. In the spectra of G191–B2B, no Zr line was identified. The strongest Zr IV line (1598.948 Å) in our model gave an upper limit of -5.6 ± 0.3 (approx. 100 times solar). No Xe line was identified in the UV spectrum of G191–B2B and we confirmed the previously determined upper limit of -6.8 ± 0.3 (ten times solar).

Conclusions. Precise measurements and calculations of atomic data are a prerequisite for advanced NLTE stellar-atmosphere modeling. Observed Zr IV–VI and Xe VI–VII line profiles in the UV spectrum of RE 0503–289 were simultaneously well reproduced with our newly calculated oscillator strengths.

Key words. atomic data – line: identification – stars: abundances – stars: individual: G191–B2B – stars: individual: RE 0503–289 – virtual observatory tools

1. Introduction

The DO-type white dwarf (WD) star RE 0503–289 (WD 0501+527, McCook & Sion 1999a,b), exhibits many lines of the trans-iron elements Zn (atomic number $Z = 30$), Ga (31), Ge (32), As (33), Se (34), Kr (36), Mo (42), Sn (50), Te (52), I (53), Xe (54), and Ba (56) in its ultraviolet spectrum. These were initially identified by Werner et al. (2012b), who

determined the Kr and Xe abundances (Sect. 8) based on atomic data available at that time. Calculations of transition probabilities for Zn, Ga, Ge, Kr, Mo, Xe, and Ba in the subsequent years allowed precise abundance measurements for these elements (Rauch et al. 2014a, 2015b, 2012, 2016a, 2014b, 2015a, 2016b, respectively).

Here we report that we have identified lines of an additional element, namely zirconium (40) which has never been detected before in WDs, and calculated new Zr IV–VII transition probabilities to determine its photospheric abundance. To verify the Xe abundance determination of Werner et al. (2012b), we calculated much more complete Xe IV–V and Xe VI transition probabilities.

The hot, hydrogen-rich, DA-type WD G191–B2B (WD 0501+527, McCook & Sion 1999a,b) is a primary flux reference standard for all absolute calibrations from 1000 to 25 000 Å (Bohlin 2007). Rauch et al. (2013) presented a detailed spectral analysis of this star. Based on their model, Rauch et al.

* Based on observations with the NASA/ESA Hubble Space Telescope, obtained at the Space Telescope Science Institute, which is operated by the Association of Universities for Research in Astronomy, Inc., under NASA contract NAS5-26666.

** Based on observations made with the NASA-CNES-CSA Far Ultraviolet Spectroscopic Explorer.

*** Tables A.9 to A.12 and B.5 to B.7 are only available via the German Astrophysical Virtual Observatory (GAVO) service TOSS (<http://dc.gvo.org/TOSS>).

Table 1. Column densities (in cm^{-2}) and radial velocities (in km/s) used to model interstellar clouds in the line of sight toward RE 0503–289.

$\text{Mg II } \lambda 2796.35 \text{ \AA}$		$\text{Mg II } \lambda 2803.53 \text{ \AA}$	
N	v_{rad}	N	v_{rad}
2.9×10^{12}	+15.0	4.5×10^{12}	+15.0
2.6×10^{12}	+7.0	3.8×10^{12}	+7.0
8.0×10^{11}	–0.5	1.2×10^{12}	–0.5
4.6×10^{11}	–4.5	8.5×10^{11}	–5.5
4.5×10^{11}	–26.5	5.0×10^{11}	–29.5
7.3×10^{11}	–43.5	1.0×10^{12}	–38.5

(2014a, 2015b, 2014b) identified Zn, Ga, and Ba lines in the observed UV spectrum and determined the abundances of these elements.

We briefly introduce our observational data in Sect. 2. The discovery of the interstellar $\text{Mg II } \lambda\lambda 2796.35, 2803.53 \text{ \AA}$ resonance doublet and its modelling is shown in Sect. 3. Our model atmospheres are described in Sect. 4. We start our spectral analysis with a search for Al lines and an abundance determination in Sect. 5. The Zr transition-probability calculation, line identification, and abundance analysis are presented in Sect. 6, followed by the same for Xe in Sect. 7. We summarize our results and conclude in Sect. 8.

2. Observations

For RE 0503–289, we analyzed ultraviolet (UV) observations that were obtained with the Far Ultraviolet Spectroscopic Explorer (FUSE, $910 \text{ \AA} < \lambda < 1188 \text{ \AA}$, resolving power $R = \lambda/\Delta\lambda \approx 20\,000$) and the Hubble Space Telescope / Space Telescope Imaging Spectrograph (HST/STIS, $1144 \text{ \AA} < \lambda < 3073 \text{ \AA}$, $R \approx 45\,800$). These were described in detail by Werner et al. (2012b) and Rauch et al. (2016b), respectively.

For G191–B2B, we used the FUSE observation described by Rauch et al. (2013) and the high-dispersion échelle spectrum (HST/STIS, $1145 - 3145 \text{ \AA}$, $R \approx 100\,000$, Rauch et al. 2013) available from the CALSPEC¹ database.

To compare observations with synthetic spectra, the latter were convolved with Gaussians to model the respective resolving power. The observed spectra are shifted to rest wavelengths according to radial-velocity measurements of $v_{\text{rad}} = 24.56 \text{ km s}^{-1}$ (Lemoine et al. 2002) and 25.8 km s^{-1} for G191–B2B and RE 0503–289 (our value), respectively.

3. Interstellar line absorption

Rauch et al. (2016b) found that the interstellar line absorption toward RE 0503–289 has a multi-velocity structure (radial-velocities $-40 \text{ km/s} < v_{\text{rad}} < +18 \text{ km/s}$). In the HST/STIS spectra of RE 0503–289, the interstellar $\text{Mg II } \lambda\lambda 2796.35, 2803.53 \text{ \AA}$ resonance lines ($3s^2S_{1/2} - 3p^2P_{3/2}^o$ and $3s^2S_{1/2} - 3p^2P_{1/2}^o$ with oscillator strengths of 0.608 and 0.303, respectively) are prominent (Fig. 1) and corroborate such a structure. Table 1 displays the parameters that were used to fit the observation.

¹ <http://www.stsci.edu/hst/observatory/cdbs/calspec.html>

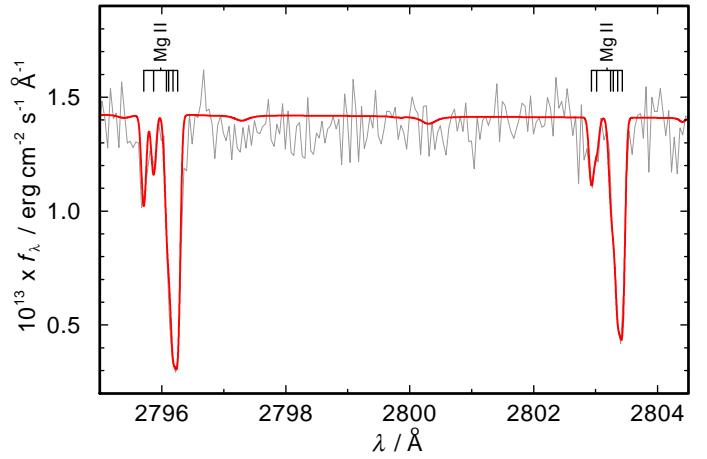


Fig. 1. Section of the STIS spectrum of RE 0503–289 with the interstellar $\text{Mg II } \lambda\lambda 2796.35, 2803.53 \text{ \AA}$ lines.

4. Model atmospheres and atomic data

We calculated plane-parallel, chemically homogeneous model atmospheres in hydrostatic and radiative equilibrium with the Tübingen non-local thermodynamic equilibrium (NLTE) Model Atmosphere Package (TMAP², Werner et al. 2003, 2012a). Model atoms were retrieved from the Tübingen Model Atom Database (TMAD³, Rauch & Deetjen 2003) that has been constructed as part of the Tübingen contribution to the German Astrophysical Virtual Observatory (GAVO⁴).

The effective temperatures, surface gravities, and photospheric abundances of G191–B2B ($T_{\text{eff}} = 60\,000 \pm 2000 \text{ K}$, $\log(g/\text{cm s}^{-2}) = 7.6 \pm 0.05$, Rauch et al. 2013) and RE 0503–289 ($T_{\text{eff}} = 70\,000 \pm 2000 \text{ K}$, $\log g = 7.50 \pm 0.1$, Rauch et al. 2016b) were previously analyzed with TMAP models. We adopt these parameters for our calculations.

Zr IV–VII and Xe IV–VII were represented by the Zr and Xe model atoms with so-called super levels and super lines that were calculated with a statistical approach via our Iron Opacity and Interface (IrOnIc⁵, Rauch & Deetjen 2003; Müller-Ringat 2013). To enable IrOnIc to read our new Zr and Xe data, we transferred it into Kurucz-formatted files (cf., Rauch et al. 2015b). The statistics of our Zr and Xe model atoms is listed in Table 2.

For Zr and Xe and all other species, level dissolution (pressure ionization) following Hummer & Mihalas (1988) and Hubeny et al. (1994) is accounted for. Broadening for all Al, Zr, and Xe lines due to the quadratic Stark effect is calculated using approximate formulae given by Cowley (1970, 1971).

All spectral energy distributions (SEDs) that were calculated for this analysis are available via the registered Theoretical Stellar Spectra Access (TheoSSA⁶) GAVO service.

5. Aluminum in RE 0503–289

The Al abundance in RE 0503–289 was hitherto undetermined. TMAD provides a recently extended Al model atom (Table 3). We used it to search for Al lines in the UV and optical spectra of G191–B2B and RE 0503–289, especially for Al IV lines, because, in both stars, this is the dominant ionization stage in the

² <http://astro.uni-tuebingen.de/~TMAP>

³ <http://astro.uni-tuebingen.de/~TMAD>

⁴ <http://www.g-vo.org>

⁵ <http://astro.uni-tuebingen.de/~TIRO>

⁶ <http://dc.g-vo.org/theossa>

Table 2. Statistics of Zr IV – VII and Xe IV – V, VII atomic levels and line transitions from Tables A.9 – A.12 and B.5 – B.7, respectively. Xe VI is shown for completeness.

ion	atomic levels	lines	super levels	super lines
Zr IV	52	135	7	20
Zr V	135	1449	7	22
Zr VI	96	1098	7	12
Zr VII	83	947	7	15
total	366	3629	28	69
Xe IV	94	1391	7	16
Xe V	65	616	7	15
Xe VI ^a	90	243	7	16
Xe VII	60	491	7	19
total	309	2741	28	66

Notes. ^(a) Atomic level and line data taken from Gallardo et al. (2015).

Table 3. Statistics of the Al model atom used in our calculations compared to our previous analyses (e.g., Rauch et al. 2013, 2016b).

ion	this work		previous analyses	
	atomic levels	lines	atomic levels	lines
Al II			1	0
Al III	24	70	7	10
Al IV	61	276	6	3
Al V	43	168	6	4
Al VI	1	0	1	0
	129	514	21	17

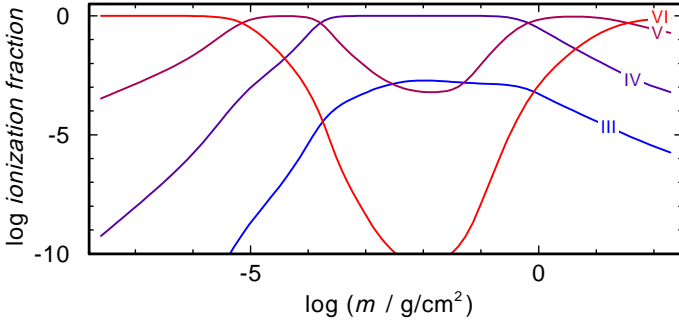


Fig. 2. Al ionization fractions in our G191–B2B model. m is the column mass, measured from the outer boundary of our model atmospheres.

line-forming region ($-4 \lesssim \log m \lesssim 0.5$, Figs. 2, 3). So far, only Al III lines were identified in the UV spectrum of G191–B2B, namely $\lambda\lambda 1854.714, 1862.787 \text{ \AA}$ (Holberg et al. 1998) and $\lambda\lambda 1379.668, 1384.130, 1605.764, 1611.812, 1611.854 \text{ \AA}$ (Rauch et al. 2013, logarithmic mass fraction of Al = -4.95 ± 0.2).

The only additional Al lines found in the observed spectra of G191–B2B are Al III $\lambda\lambda 1935.840, 1935.863, \text{ and } 1935.949 \text{ \AA}$ (Fig. 4). Al IV lines in our model are entirely too weak to detect them in the observations. Compared to the available STIS spectrum of G191–B2B, that of RE 0503–289 has a much lower signal-to-noise ratio (S/N) that hampers detection of Al lines. Al III $\lambda\lambda 1384.130 \text{ \AA}$ is the only line that is present in the observation and is well reproduced at a solar Al abundance (-4.28 ± 0.2). This result is based on a single line only, and thus it must be judged as uncertain. It is, however, at least an upper abundance limit. The derived abundance is, nonetheless, in good agreement

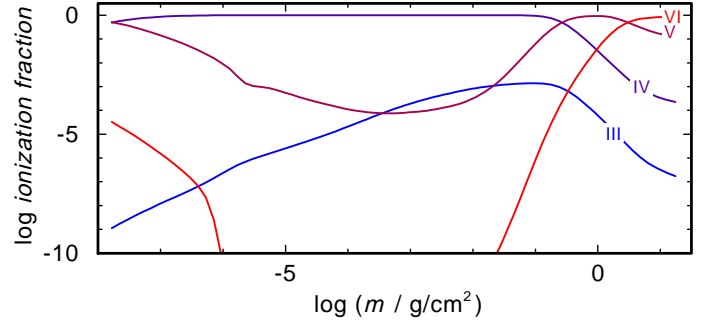


Fig. 3. As Fig. 2, for RE 0503–289.

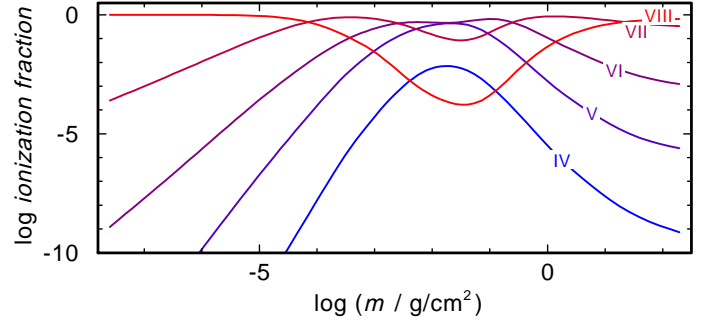


Fig. 5. Like Fig. 2, for Zr.

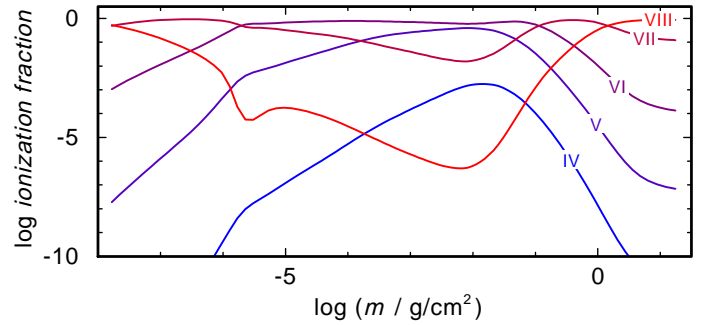


Fig. 6. Like Fig. 3, for Zr.

with the expectation (interpolation in Fig. 10). To improve the Al abundance measurement, better UV spectra for RE 0503–289 are highly desirable.

6. Zirconium

6.1. Oscillator-strength calculations for Zr IV – VII ions

Radiative decay rates (oscillator strengths and transition probabilities) were computed using the pseudo-relativistic Hartree-Fock (HFR) method originally introduced by Cowan (1981), and modified for taking into account core-polarization effects (CPOL), giving rise to the HFR+CPOL approach (e.g., Quinet et al. 1999, 2002).

For Zr IV, configuration interaction was considered among the configurations $4s^2 4p^6 nd$ ($n = 4 - 9$), $4s^2 4p^6 ns$ ($n = 5 - 9$), $4s^2 4p^6 ng$ ($n = 5 - 9$), $4s^2 4p^6 ni$ ($n = 7 - 9$), $4s^2 4p^5 4d 5p$, $4s^2 4p^5 4d 4f$, and $4s^2 4p^5 4d 5f$ for the even parity, and $4s^2 4p^6 np$ ($n = 5 - 9$), $4s^2 4p^6 nf$ ($n = 4 - 9$), $4s^2 4p^6 nh$ ($n = 6 - 9$), $4s^2 4p^6 nk$ ($n = 8 - 9$), $4s^2 4p^5 4d^2$, $4s^2 4p^5 4d 5s$, and $4s^2 4p^5 4d 5d$ for the odd parity. The core-polarization parameters were the dipole polarizability of a Zr VI ionic core as reported by Fraga et al. (1976), that is, $\alpha_d = 2.50 \text{ a.u.}$, and the cut-off radius corresponding to the

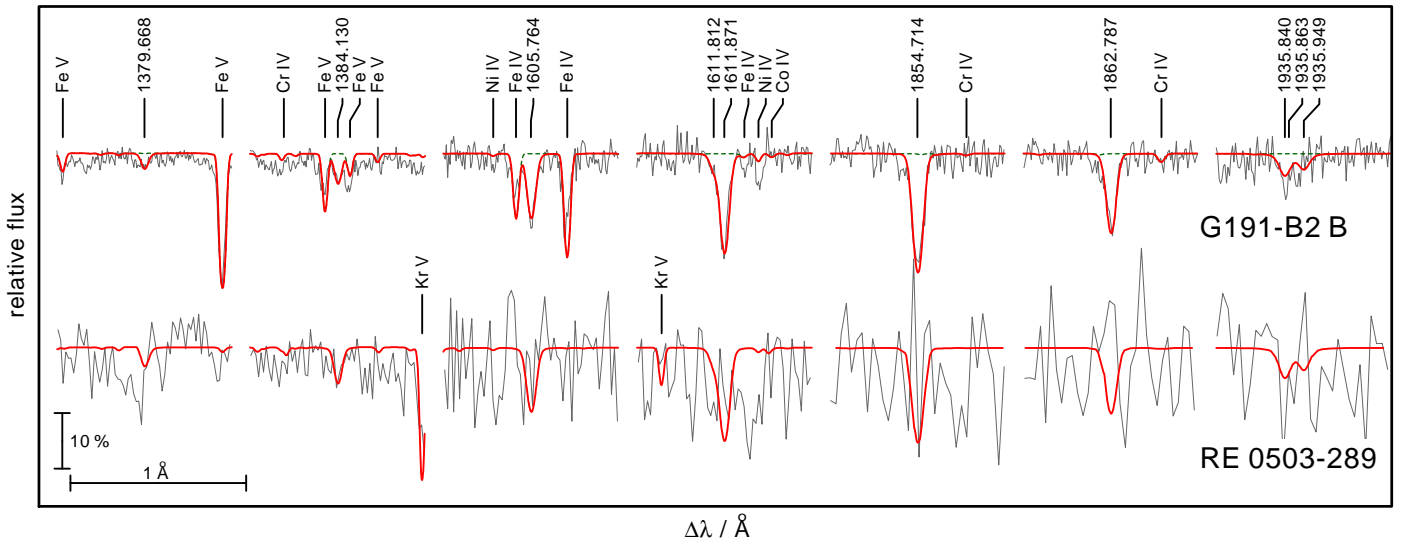


Fig. 4. Comparison of sections of the STIS spectra with our models for G191-B2B (top) and RE 0503-289 (bottom). The Al abundances are 1.1×10^{-5} (0.2 times the solar value, Rauch et al. 2013) and 5.3×10^{-5} (solar), respectively. In the top panel, the green dashed line is a spectrum calculated without Al. Prominent lines are marked, the identified Al III lines with their wavelengths.

HFR mean value $\langle r \rangle$ of the outermost core orbital (4p), that is, $r_c = 1.34$ a.u. Using the experimental energy levels taken from the analysis by Reader & Acquista (1997), the average energies and spin-orbit parameters of $4s^2 4p^6 nd$ ($n = 4 - 6$), $4s^2 4p^6 ns$ ($n = 5 - 8$), $4s^2 4p^6 ng$ ($n = 5 - 9$), $4s^2 4p^6 np$ ($n = 5 - 7$), $4s^2 4p^6 nf$ ($n = 4 - 6$), and $4s^2 4p^6 h$ configurations were adjusted using a well-established least-squares fitting procedure in which the mean deviations with experimental data were found to be equal to 0 cm^{-1} for the even parity and 6 cm^{-1} for the odd parity.

For Zr v, the configurations explicitly included in the HFR model were $4s^2 4p^6$, $4s^2 4p^5 np$ ($n = 5 - 7$), $4s^2 4p^5 nf$ ($n = 4 - 7$), $4s^2 4p^5 nd$ ($n = 4 - 7$), $4s^2 4p^5 ns$ ($n = 5 - 7$), $4s^2 4p^4 d^2$, $4s^2 4p^4 d^2 5s$, and $4s^2 4p^4 5s^2$ for the even parity, and $4s^2 4p^5 nd$ ($n = 4 - 7$), $4s^2 4p^5 ns$ ($n = 5 - 10$), $4s^2 4p^5 ng$ ($n = 5 - 7$), $4s^2 4p^5 np$ ($n = 5 - 7$), $4s^2 4p^5 nf$ ($n = 4 - 7$), $4s^2 4p^4 d^2 5p$, and $4s^2 4p^4 d^2 4f$ for the odd parity. Core-polarization effects were estimated using $\alpha_d = 0.08$ a.u. and $r_c = 0.45$ a.u. These values correspond to a Ni-like Zr xiii ionic core, with 3d as an outermost core subshell. In this ion, the semi-empirical process was performed to optimize the average energies, spin-orbit parameters, and electrostatic interaction Slater integrals corresponding to $4p^6$, $4p^5 np$ ($n = 5 - 6$), $4p^5 4f$, $4s^2 4p^6 4d$, $4p^5 nd$ ($n = 4 - 7$), $4p^5 ns$ ($n = 5 - 10$), $4p^5 ng$ ($n = 5 - 6$), and $4s^2 4p^6 5p$ configurations using the experimental levels reported by Reader & Acquista (1979) and Khan et al. (1981). The mean deviations between calculated and experimental energies were 77 cm^{-1} and 91 cm^{-1} for even and odd parities, respectively.

In the case of Zr vi, the HFR method was used with the interacting configurations $4s^2 4p^5$, $4s^2 4p^4 np$ ($n = 5 - 6$), $4s^2 4p^4 nf$ ($n = 4 - 6$), $4s^2 4p^5 nd$ ($n = 4 - 6$), $4s^2 4p^5 ns$ ($n = 5 - 6$), $4p^6 np$ ($n = 5 - 6$), $4p^6 nf$ ($n = 4 - 6$), $4s^2 4p^3 d^2$, $4s^2 4p^3 d^2 5s$, and $4s^2 4p^3 5s^2$ for the odd parity, and $4s^2 4p^6$, $4s^2 4p^4 nd$ ($n = 4 - 6$), $4s^2 4p^4 ns$ ($n = 5 - 6$), $4s^2 4p^4 ng$ ($n = 5 - 6$), $4s^2 4p^5 np$ ($n = 5 - 6$), $4s^2 4p^5 nf$ ($n = 4 - 6$), $4p^6 ns$ ($n = 5 - 6$), $4p^6 nd$ ($n = 4 - 6$), $4s^2 4p^3 d^2 5p$, and $4s^2 4p^3 d^2 4f$ for the even parity. Core-polarization effects were estimated using the same α_d and r_c values as those considered in Zr v. The radial integrals corresponding to $4p^5$, $4p^4 5p$, $4s^2 4p^6$, $4p^4 5d$, $4p^4 5s$, and $4p^4 6s$ were adjusted to minimize the differences between the calculated Hamiltonian eigenvalues and the experimental energy levels taken from Reader & Lindsay (2016).

In this process, we found mean deviations equal to 111 cm^{-1} in the odd parity and 221 cm^{-1} in the even parity.

Finally, for Zr vii, the configurations included in the HFR model were $4s^2 4p^4$, $4s^2 4p^3 np$ ($n = 5 - 6$), $4s^2 4p^3 nf$ ($n = 4 - 6$), $4s^2 4p^4 nd$ ($n = 4 - 6$), $4s^2 4p^4 ns$ ($n = 5 - 6$), $4p^5 np$ ($n = 5 - 6$), $4p^5 nf$ ($n = 4 - 6$), $4s^2 4p^2 d^2$, $4s^2 4p^2 d^2 5s$, and $4s^2 4p^2 5s^2$ for the even parity, and $4s^2 4p^5$, $4s^2 4p^3 nd$ ($n = 4 - 6$), $4s^2 4p^3 ns$ ($n = 5 - 6$), $4s^2 4p^3 ng$ ($n = 5 - 6$), $4s^2 4p^4 np$ ($n = 5 - 6$), $4s^2 4p^4 nf$ ($n = 4 - 6$), $4p^5 ns$ ($n = 5 - 6$), $4p^5 nd$ ($n = 4 - 6$), $4s^2 4p^2 d^2 5p$, and $4s^2 4p^2 d^2 4f$ for the odd parity. The same core-polarization parameters as those used in Zr v and Zr vi calculations were considered while the radial integrals of $4p^4$, $4p^3 5p$, $4s^2 4p^5$, $4p^3 4d$, and $4p^3 5s$ were optimized with the experimental energy levels taken from Reader & Acquista (1976); Rahimullah et al. (1978); Khan et al. (1983). Although having established level values, the $4p^3 4f$ configuration was not fitted because it appeared very strongly mixed with experimentally unknown configurations such as $4s^2 4p^4 d^2$, and $4s^2 4p^2 d^2$ according to our HFR calculations. This semi-empirical process led to mean deviations of 695 cm^{-1} and 479 cm^{-1} for even and odd parities, respectively.

The parameters adopted in our computations are summarized in Tables A.1 - A.4 while computed and available experimental energies are compared in Tables A.5 - A.8, for Zr iv-vii, respectively. Tables A.9 - A.12 give the HFR weighted oscillator strengths ($\log gf$) and transition probabilities (gA , in s^{-1}) together with the numerical values (in cm^{-1}) of the lower and upper energy levels and the corresponding wavelengths (in Å). In the last column of each table, we also give the cancellation factor, CF , as defined by Cowan (1981). We note that very low values of this factor (typically < 0.05) indicate strong cancellation effects in the calculation of line strengths. In these cases, the corresponding gf and gA values could be very inaccurate and therefore need to be considered with some care. However, very few of the transitions appearing in Tables A.9 - A.12 are affected. These tables are provided via the registered GAVO Tübingen Oscillator Strengths Service (TOSS⁷).

⁷ <http://dc.g-vo.org/TOSS>

Table 4. Identified Zr lines in the UV spectrum of RE 0503–289. The wavelengths correspond to those in Tables A.9 – A.11.

		wavelength / Å	comment
Zr	IV	1598.948	
Zr	V	1001.765	
		1002.484	
		1068.551	blend Ga v
		1119.158	uncertain
		1200.760	
		1245.951	
		1260.909	
		1265.381	
		1303.933	
		1306.762	
		1323.826	
		1332.065	
		1355.216	
		1355.975	
		1376.544	
		1633.027	
		1725.024	uncertain
Zr	VI	1053.548	
		1064.818	
		1068.663	uncertain
		1099.591	
		1118.689	
		1151.571	
		1514.568	
		1521.699	
		1591.799	
		1682.241	
		1749.350	uncertain

6.2. Zr line identification and abundance analysis

In the FUSE and HST/STIS observations of RE 0503–289, we identified Zr IV–VI lines (Table 4). The observation is well reproduced by our model calculated with a mass fraction of $\log \text{Zr} = -3.5 \pm 0.2$ (Fig. 7). The Zr IV/V ionization equilibria are matched by our model.

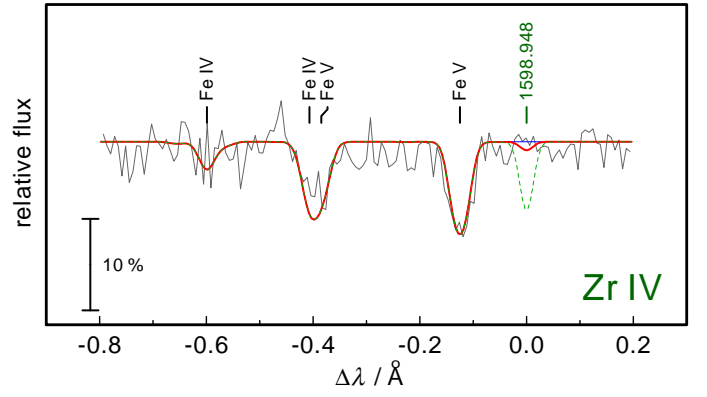
In our synthetic spectra for G191–B2B, Zr IV λ 1598.948 Å is the strongest line. A comparison with the STIS spectrum shows that a Zr mass fraction of 2.6×10^{-6} (approximately 100 times solar, Grevesse et al. 2015) is the upper detection limit (Fig. 8).

7. Xenon

7.1. Oscillator-strength calculations for Xe IV, V, and VII ions

New calculations of oscillator strengths and radiative transition probabilities in xenon ions were also performed using the HFR+CPOL method (Cowan 1981; Quinet et al. 1999, 2002).

For Xe IV, the multiconfiguration expansion included $5s^2 5p^3$, $5s^2 5p^2 6p$, $5s^2 5p^2 nf$ ($n = 4 - 6$), $5s^2 5p 5d 6s$, $5s^2 5p 5d 6d$, $5s^2 5p 6s^2$, $5s^2 5p 5d^2$, $5s^2 5p 4f^2$, $5s 5p^3 6s$, $5s 5p^3 nd$ ($n = 5 - 6$), $5s 5p^2 4f 5d$, and $5p^5$ for the odd parity, and $5s 5p^4$, $5s^2 5p^2 nd$ ($n = 5 - 6$), $5s^2 5p^2 6s$, $5s^2 5p^2 ng$ ($n = 5 - 6$), $5s^2 5p 5d 6p$, $5s^2 5p 5d nf$ ($n = 4 - 6$), $5s 5p^3 6p$, $5s 5p^3 nf$ ($n = 4 - 6$), and $5s 5p^2 5d^2$ for the even parity. The core-polarization effects were estimated with $\alpha_d = 0.88$ a.u. and $r_c = 0.86$ a.u. which correspond to a Pd-like Xe IX ionic core. The former value was taken from Fraga et al. (1976)

**Fig. 8.** Section of the STIS spectrum of G191–B2B around Zr IV λ 1598.948 Å compared with three synthetic spectra (thin, blue: no Zr, thick, red: Zr mass fraction = 2.6×10^{-6} , dashed green: Zr = 2.6×10^{-5}).

while the latter one corresponds to the HFR mean value $\langle r \rangle$ of the outermost core orbital (4d). The experimental energy levels published by Saloman (2004) were then used to optimize the radial parameters belonging to the $5p^3$, $5p^2 6p$, $5p^2 4f$, $5s 5p^4$, $5p^2 5d$, and $5p^2 6s$ configurations allowing us to reach average deviations between calculated and observed energies of 137 cm^{-1} and 251 cm^{-1} , for odd and even parities, respectively.

In the case of Xe V, the following sets of configurations were considered in the HFR model: $5s^2 5p^2$, $5s^2 5p 6p$, $5s^2 5p nf$ ($n = 4 - 6$), $5s^2 5d 6s$, $5s^2 5d 6d$, $5s^2 6s^2$, $5s^2 5d^2$, $5s^2 4f^2$, $5s^2 5f^2$, $5s 5p^2 6s$, $5s 5p^2 nd$ ($n = 5 - 6$), $5s 5p 6s 6p$, $5s 5p 6p nd$ ($n = 5 - 6$), $5p^4$, $5p^3 6p$, and $5p^3 nf$ ($n = 4 - 6$) for the even parity, and $5s 5p^3$, $5s^2 5p nd$ ($n = 5 - 6$), $5s^2 5p ns$ ($n = 6 - 7$), $5s^2 5p ng$ ($n = 5 - 6$), $5s^2 5d 6p$, $5s^2 5d nf$ ($n = 4 - 6$), $5s 5p^2 6p$, $5s 5p^2 nf$ ($n = 4 - 6$), $5s 5p 6s nd$ ($n = 5 - 6$), $5s 5p 5d 6d$, $5s 5p 6s^2$, $5s 5p 5d^2$, $5p^3 6s$, and $5p^3 nd$ ($n = 5 - 6$) for the odd parity. The same core-polarization parameters as those used for Xe IV were used and the experimental energy levels reported by Saloman (2004) and Raineri et al. (2009) were incorporated into the semi-empirical fit to adjust the radial integrals corresponding to the $5p^2$, $5p 6p$, $5p 4f$, $5s 5p^3$, $5p 5d$, $5p 6d$, $5p 6s$, and $5p 7s$ configurations. In this process, we found mean deviations equal to 144 cm^{-1} in the even parity and 110 cm^{-1} in the odd parity.

For Xe VI, we used the same atomic data as those considered in one of our previous papers (Rauch et al. 2015a). More precisely, the radiative rates were taken from the work of Gallardo et al. (2015) who performed HFR+CPOL calculations including 35 odd-parity and 34 even-parity configurations, that is, $5s^2 np$ ($n = 5 - 8$), $5s^2 nf$ ($n = 4 - 8$), $5s^2 nh$ ($n = 6 - 8$), $5s^2 8k$, $5p^2 np$ ($n = 6 - 8$), $5p^2 nf$ ($n = 4 - 8$), $5p^2 nh$ ($n = 6 - 8$), $5p^2 8k$, $5s 5p 6s$, $5s 5p nd$ ($n = 5 - 6$), $5s 5p ng$ ($n = 5 - 6$), $5p^3$, $5s 5d nf$ ($n = 4 - 5$), $5s 6s nf$ ($n = 4 - 5$), and $5s 5p^2$, $5s^2 ns$ ($n = 6 - 8$), $5s^2 nd$ ($n = 5 - 8$), $5s^2 ng$ ($n = 5 - 8$), $5s^2 ni$ ($n = 7 - 8$), $5p^2 nd$ ($n = 5 - 8$), $5p^2 ns$ ($n = 6 - 8$), $5p^2 ng$ ($n = 5 - 8$), $5p^2 ni$ ($n = 7 - 8$), $5s 5p nf$ ($n = 4 - 6$), $5s 4f^2$, $5s 5f^2$, $5s 5p 6p$, $4d^9 5p^4$, respectively. In this latter study, the core-polarization effects were considered with two different ionic cores, that is, a Cd-like Xe VII core with $\alpha_d = 5.80$ a.u. for the $5s^2 nl - 5s^2 n'l'$ transitions, and a Pd-like Xe IX core with $\alpha_d = 0.99$ a.u. for all the other transitions. In their semi-empirical least-squares fitting process, Gallardo et al. (2015) achieved standard deviations with experimental energy levels of 149 cm^{-1} in the odd parity and 154 cm^{-1} in the even parity.

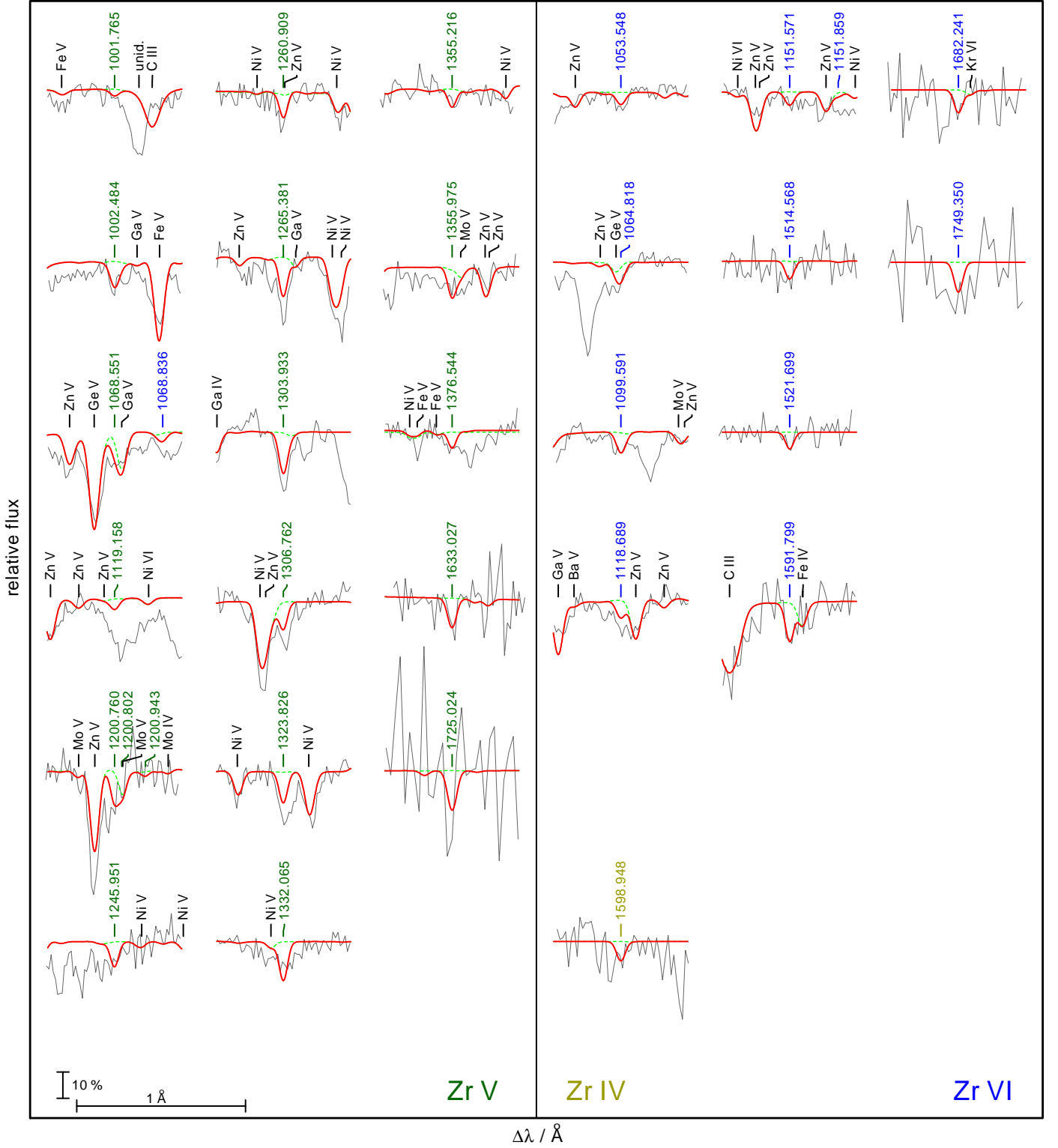


Fig. 7. Identified Zr iv (bottom of right panel), Zr v (left panel), and Zr vi (right panel) lines in the FUSE ($\lambda < 1188 \text{ \AA}$) and HST/STIS observations of RE0503–289. The model (thick, red line) was calculated with an abundance of $\log \text{Zr} = -3.5$. The dashed green spectrum was calculated without Zr. Prominent lines are marked, the Zr lines with their wavelengths from Tables A.9 - A.11.

Finally, for Xe vii, we used the same model as the one considered by Biémont et al. (2007) extending the set of oscillator strengths to weaker transitions (up to $\log gf > -8$). As a reminder, these authors explicitly retained the following configurations in their configuration interaction expansions: $5s^2$, $5p^2$, $5d^2$, $4f^2$, $4fnp$ ($n = 5 - 6$), $4f6f$, $4f6h$, $5s6s$, $5snd$ ($n = 5 - 6$), $5sng$

($n = 5 - 6$), $5pnf$ ($n = 5 - 6$), $5p6p$, $5p6h$, $5d6s$, $5d6d$, and $5dng$ ($n = 5 - 6$) for the even parity, and $5snp$ ($n = 5 - 6$), $5snf$ ($n = 4 - 6$), $5s6h$, $4f6s$, $4fnd$ ($n = 5 - 6$), $4fng$ ($n = 5 - 6$), $5p6s$, $5pnd$ ($n = 5 - 6$), $5png$ ($n = 5 - 6$), $5d6p$, and $5dnf$ ($n = 5 - 6$), $5d6h$ for the odd parity. The same ionic core parameters as those used for Xe IV and Xe V ions were considered and all the experimental

Table 5. Identified Xe lines in the UV spectrum of RE 0503–289. The wavelengths correspond to those given in Gallardo et al. (2015) and in Table B.7 for Xe VI and Xe VII, respectively.

	wavelength / Å	comment
Xe VI	915.163	weak
	928.366 ^a	
	929.131 ^b	
	967.550 ^a	
	970.177	weak
	1017.270 ^b	
	1080.080 ^a	
	1091.630 ^a	
	1101.940 ^a	
	1110.450	weak
	1136.410 ^a	
	1179.540 ^a	
	1181.390 ^a	
	1181.540	blend with Xe VI λ 1181.390 Å
	1184.390 ^a	uncertain
Xe VII	1228.450	
	1280.270	
	1298.910 ^b	
	1439.250	
	995.516 ^a	
	1077.120 ^a	
	1243.565	

Notes. ^(a) identified by Werner et al. (2012b), ^(b) identified by Rauch et al. (2015a)

energy levels published by Saloman (2004) were included in the semi-empirical optimization of the radial parameters belonging to the 5s², 5s6s, 5s5d, 5s6d, 5p², 4f5p, 5s5p, 5s6p, 5s4f, 5s5f, 5p6s, and 5p5d configurations giving rise to standard deviations of 377 cm⁻¹ and 250 cm⁻¹ for even- and odd-parity levels, respectively.

The radial parameters used in our computations are summarized in Tables B.1 – B.2 for the Xe IV–V ions, respectively. The calculated energy levels are compared with available experimental values in Tables B.3 – B.4 while the HFR weighted oscillator strengths ($\log gf$) and transition probabilities (gA in s⁻¹) are reported in Tables B.5 – B.7 for the Xe IV–V and VII ions, respectively. In the latter tables, we also give the numerical values (in cm⁻¹) of lower and upper energy levels of each transition together with the corresponding wavelength (in Å) and the CF , as introduced in Sect. 6.1. These tables are provided via TOSS.

7.2. Xe line identification and abundance analysis

In the FUSE and HST/STIS observations of RE 0503–289, we identified Xe VI–VII lines (Table 5). The observation is well reproduced by our model, calculated with a mass fraction of $\log Xe = -3.9 \pm 0.2$ (Fig. 9). This is a factor of two higher than that previously determined by Werner et al. (2012b, $\log Xe = -4.2 \pm 0.6$) but agrees within their given error limits. The Xe VI/VII ionization equilibrium is matched by our model.

8. Results and conclusions

To search for Al lines in the observed UV spectrum of RE 0503–289, we created an extended Al model atom for our NLTE model-atmosphere calculations. We could only identify

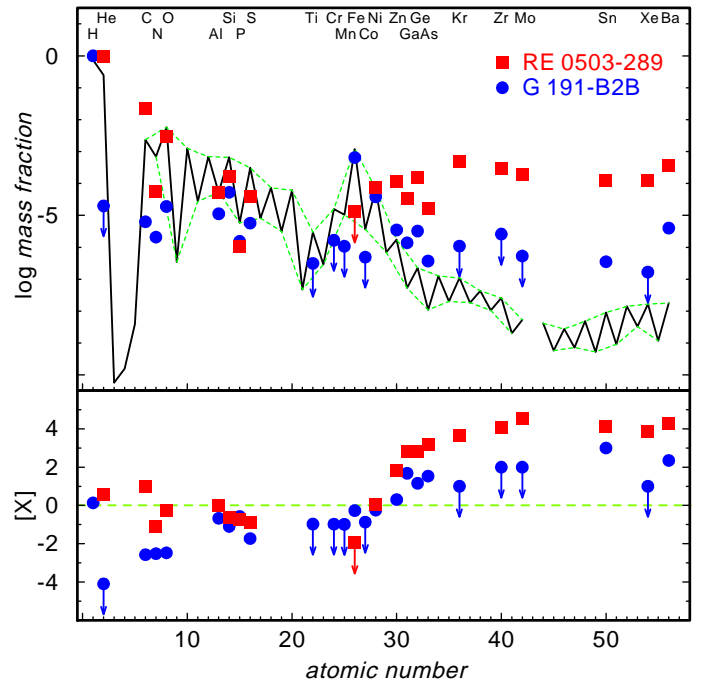


Fig. 10. Solar abundances (Asplund et al. 2009; Scott et al. 2015b,a; Grevesse et al. 2015, thick line; the dashed lines connect the elements with even and with odd atomic number) compared with the determined photospheric abundances of G191–B2B (blue circles, Rauch et al. 2013) and RE 0503–289 (red squares, Dreizler & Werner 1996; Rauch et al. 2012, 2014a,b, 2015a,b, 2016a,b, and this work). The uncertainties of the WD abundances are, in general, approximately 0.2 dex. The arrows indicate upper limits. Top panel: Abundances given as logarithmic mass fractions. Bottom panel: Abundance ratios to respective solar values, $[X]$ denotes $\log(\text{fraction}/\text{solar fraction})$ of species X . The dashed green line indicates solar abundances.

Al III $\lambda\lambda$ 1384.130 Å (Sect. 5), that was well suited to measure the Al abundance. It is reproduced at a solar value (-4.28 ± 0.2 , mass fraction). This needs to be verified once better observations are available.

We identified Zr IV – VI lines in the observed high-resolution UV spectra RE 0503–289 (Table 4). These were well modeled using our newly calculated Zr IV–VII oscillator strengths. We determined a photospheric abundance of $\log Zr = -3.52 \pm 0.2$ (mass fraction, $1.5 - 4.8 \times 10^{-4}$, 5775 – 14 480 times the solar abundance). This highly supersolar Zr abundance corresponds to the high abundances of other trans-iron elements in RE 0503–289 (Fig. 10). The Zr IV/V ionization equilibria are well matched by our model ($T_{\text{eff}} = 70\,000$ K, $\log g = 7.5$).

In addition to the previously discovered Xe VI – VII lines in the UV spectrum of RE 0503–289, we identified five new Xe VI lines. All identified Xe lines are well matched by our model with an abundance of $\log Xe = -3.88 \pm 0.2$ (mass fraction, $0.8 - 2.1 \times 10^{-4}$, 4985 – 12 520 times the solar abundance). This highly supersolar Xe abundance is in line with abundances of other trans-iron elements in RE 0503–289 (Fig. 10).

The amount of trans-iron elements in the photosphere of RE 0503–289 strongly exceeds the yields of nucleosynthesis on the asymptotic giant branch (Fig. 11). It is likely that radiative levitation is working efficiently in RE 0503–289 (Rauch et al. 2016a), increasing abundances by up to 4 dex compared with solar values.

The identification of lines of Zr and Xe and their precise abundance determinations only became possible after reliable

that provides weighted oscillator strengths and transition probabilities was constructed as part of the activities of the German Astrophysical Virtual Observatory.

References

- Asplund, M., Grevesse, N., Sauval, A. J., & Scott, P. 2009, *ARA&A*, 47, 481
- Biémont, É., Clar, M., Fivet, V., et al. 2007, *European Physical Journal D*, 44, 23
- Bohlin, R. C. 2007, in *Astronomical Society of the Pacific Conference Series*, Vol. 364, *The Future of Photometric, Spectrophotometric and Polarimetric Standardization*, ed. C. Sterken, 315
- Cowan, R. D. 1981, *The theory of atomic structure and spectra* (Berkeley, CA, University of California Press)
- Cowley, C. R. 1970, *The theory of stellar spectra* (Gordon & Breach, New York)
- Cowley, C. R. 1971, *The Observatory*, 91, 139
- Dreizler, S. & Werner, K. 1996, *A&A*, 314, 217
- Fraga, S., Karwowski, J., & Saxena, K. M. S. 1976, *Handbook of Atomic Data* (Elsevier, Amsterdam)
- Gallardo, M., Raineri, M., Reyna Almandos, J., Pagan, C. J. B., & Abrahão, R. A. 2015, *ApJS*, 216, 11
- Grevesse, N., Scott, P., Asplund, M., & Sauval, A. J. 2015, *A&A*, 573, A27
- Holberg, J. B., Barstow, M. A., & Sion, E. M. 1998, *ApJS*, 119, 207
- Hubeny, I., Hummer, D. G., & Lanz, T. 1994, *A&A*, 282, 151
- Hummer, D. G. & Mihalas, D. 1988, *ApJ*, 331, 794
- Karakas, A. I. & Lugaro, M. 2016, *ApJ*, 825, 26
- Khan, Z. A., Chaghtai, M. S. Z., & Rahimullah, K. 1983, *Journal of Physics B: Atomic and Molecular Physics*, 16, 1685
- Khan, Z. A., Rahimullah, K., & Chaghtai, M. S. Z. 1981, *Physica Scripta*, 23, 843
- Lemoine, M., Vidal-Madjar, A., Hébrard, G., et al. 2002, *ApJS*, 140, 67
- McCook, G. P. & Sion, E. M. 1999a, *ApJS*, 121, 1
- McCook, G. P. & Sion, E. M. 1999b, *VizieR Online Data Catalog*, 3210, 0
- Müller-Ringat, E. 2013, *Dissertation, University of Tübingen, Germany*, <http://www.ivoa.net/documents/SimDM/index.html>
- Quinet, P., Palmeri, P., Biémont, É., et al. 2002, *J. Alloys Comp.*, 344, 255
- Quinet, P., Palmeri, P., Biémont, É., et al. 1999, *MNRAS*, 307, 934
- Rahimullah, K., Chaghtai, M. S. Z., & Khatoon, S. 1978, *Physica Scripta*, 18, 96
- Raineri, M., Gallardo, M., Padilla, S., & Reyna Almandos, J. 2009, *Journal of Physics B Atomic Molecular Physics*, 42, 205004
- Rauch, T. & Deetjen, J. L. 2003, in *Astronomical Society of the Pacific Conference Series*, Vol. 288, *Stellar Atmosphere Modeling*, ed. I. Hubeny, D. Mihalas, & K. Werner, 103
- Rauch, T., Hoyer, D., Quinet, P., Gallardo, M., & Raineri, M. 2015a, *A&A*, 577, A88
- Rauch, T., Quinet, P., Hoyer, D., et al. 2016a, *A&A*, 587, A39
- Rauch, T., Quinet, P., Hoyer, D., et al. 2016b, *A&A*, 590, A128
- Rauch, T., Werner, K., Biémont, É., Quinet, P., & Kruk, J. W. 2012, *A&A*, 546, A55
- Rauch, T., Werner, K., Bohlin, R., & Kruk, J. W. 2013, *A&A*, 560, A106
- Rauch, T., Werner, K., Quinet, P., & Kruk, J. W. 2014a, *A&A*, 564, A41
- Rauch, T., Werner, K., Quinet, P., & Kruk, J. W. 2014b, *A&A*, 566, A10
- Rauch, T., Werner, K., Quinet, P., & Kruk, J. W. 2015b, *A&A*, 577, A6
- Reader, J. & Acquista, N. 1976, *Journal of the Optical Society of America* (1917-1983), 66, 896
- Reader, J. & Acquista, N. 1979, *Journal of the Optical Society of America* (1917-1983), 69, 239
- Reader, J. & Acquista, N. 1997, *Journal of the Optical Society of America B Optical Physics*, 14, 1328
- Reader, J. & Lindsay, M. D. 2016, *Phys. Scr.*, 91, 025401
- Saloman, E. B. 2004, *Journal of Physical and Chemical Reference Data*, 33, 765
- Scott, P., Asplund, M., Grevesse, N., Bergemann, M., & Sauval, A. J. 2015a, *A&A*, 573, A26
- Scott, P., Grevesse, N., Asplund, M., et al. 2015b, *A&A*, 573, A25
- Werner, K., Deetjen, J. L., Dreizler, S., et al. 2003, in *Astronomical Society of the Pacific Conference Series*, Vol. 288, *Stellar Atmosphere Modeling*, ed. I. Hubeny, D. Mihalas, & K. Werner, 31
- Werner, K., Dreizler, S., & Rauch, T. 2012a, *TMAP: Tübingen NLTE Model-Atmosphere Package*, *Astrophysics Source Code Library* [record ascl:1212.015]
- Werner, K., Rauch, T., Ringat, E., & Kruk, J. W. 2012b, *ApJ*, 753, L7

Appendix A: Additional tables for zirconium

Table A.1. Radial parameters (in cm^{-1}) adopted for the calculations in Zr IV.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Even parity					
4d	E _{av}	3588	3569	0.975	
	ζ _{4d}	515	503		
5d	E _{av}	149752	147800	1.172	
	ζ _{5d}	116	136		
6d	E _{av}	200505	198248	1.209	
	ζ _{6d}	53	64		
5s	E _{av}	42289	41703		
6s	E _{av}	155574	152690		
7s	E _{av}	202666	200188		
8s	E _{av}	227115	224846		
5g	E _{av}	208796	207068	1.000	F
	ζ _{5g}	0.4	0.4		
6g	E _{av}	230427	228611	1.000	F
	ζ _{6g}	0.2	0.2		
7g	E _{av}	243494	241615	1.000	F
	ζ _{7g}	0.1	0.1		
8g	E _{av}	251971	250056	1.000	F
	ζ _{8g}	0.1	0.1		
9g	E _{av}	257782	255844	1.000	F
	ζ _{9g}	0.0	0.0		
Odd parity					
5p	E _{av}	86720	85912	1.197	
	ζ _{5p}	1388	1661		
6p	E _{av}	173349	170865	1.178	
	ζ _{6p}	567	668		
7p	E _{av}	211618	209318	1.174	
	ζ _{7p}	290	341		
4f	E _{av}	162823	161581	1.000	F
	ζ _{4f}	2.3	2.3		
5f	E _{av}	205133	202889	1.000	F
	ζ _{5f}	1.3	1.3		
6f	E _{av}	228142	225772	1.000	F
	ζ _{6f}	0.8	0.8		
6h	E _{av}	230751	228744	1.000	F
	ζ _{6h}	0.1	0.1		

^a F: Fixed parameter value.

Table A.2. Radial parameters (in cm^{-1}) adopted for the calculations in Zr V.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Even parity					
4p ⁶	E_{av}	17448	17850		
4p ⁵ 5p	E_{av}	387307	386625		
	ζ_{4p}	9939	10310	1.037	
	ζ_{5p}	1865	2181	1.169	
	$F^2(4p,5p)$	22698	18416	0.811	
	$G^0(4p,5p)$	4681	3978	0.850	
	$G^2(4p,5p)$	6345	5392	0.850	R1
4p ⁵ 6p	E_{av}	502342	500684	1.012	
	ζ_{4p}	9978	10094		
	ζ_{6p}	806	806	1.000	F
	$F^2(4p,6p)$	8810	9530	1.082	

Table A.2. continued.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
4p ⁵ 4f	G ⁰ (4p,6p)	1627	1480	0.909	R2
	G ² (4p,6p)	2338	2127	0.909	R2
	E _{av}	467645	466814		
	ζ _{4p}	9921	10271	1.035	
	ζ _{4f}	5.6	5.6	1.000	F
	F ² (4p,4f)	26008	22351	0.859	
	G ² (4p,4f)	15949	15868	0.995	R3
4s4p ⁶ 4d	G ⁴ (4p,4f)	10543	10489	0.995	R3
	E _{av}	489915	486506		
	ζ _{4d}	632	602	0.951	
	G ² (4s,4d)	59108	55453	0.938	
4p ⁵ 4f–4s4p ⁶ 4d	R ¹ (4s4f;4p4d)	48624	41323	0.850	R4
	R ² (4s4f;4p4d)	29168	24793	0.850	R4
Odd parity					
4p ⁵ 4d	E _{av}	282268	268099		
	ζ _{4p}	9573	9593	1.002	
	ζ _{4d}	616	651	1.057	
	F ² (4p,4d)	65494	57294	0.875	
	G ¹ (4p,4d)	81132	66326	0.818	
	G ³ (4p,4d)	50008	44565	0.891	
	E _{av}	479226	463036		
4p ⁵ 5d	ζ _{4p}	9933	10320	1.039	
	ζ _{5d}	163	194	1.185	
	F ² (4p,5d)	16341	13181	0.807	
	G ¹ (4p,5d)	9999	6618	0.662	
	G ³ (4p,5d)	7140	6306	0.883	
	E _{av}	551860	535375		
	ζ _{4p}	9974	10464	1.049	
4p ⁵ 6d	ζ _{6d}	77	77	1.000	F
	F ² (4p,6d)	7018	3966	0.565	R5
	G ¹ (4p,6d)	3816	2156	0.565	R5
	G ³ (4p,6d)	2854	1613	0.565	R5
	E _{av}	589057	573664		
	ζ _{4p}	9989	9989	1.000	F
	ζ _{7d}	43	43	1.000	F
4p ⁵ 7d	F ² (4p,7d)	3731	2109	0.565	R5
	G ¹ (4p,7d)	1940	1096	0.565	R5
	G ³ (4p,7d)	1484	839	0.565	R5
	E _{av}	349759	335259		
	ζ _{4p}	9867	10182	1.032	
	G ¹ (4p,5s)	7881	7278	0.923	
	E _{av}	495108	478170		
4p ⁵ 6s	ζ _{4p}	9959	10316	1.036	
	G ¹ (4p,6s)	2433	2132	0.876	
	E _{av}	558823	542240		
4p ⁵ 7s	ζ _{4p}	9984	10360	1.038	
	G ¹ (4p,7s)	1115	980	0.879	
	E _{av}	592851	576592		
4p ⁵ 8s	ζ _{4p}	9994	9994	1.000	F
	G ¹ (4p,8s)	613	552	0.900	F
	E _{av}	613233	596840		
4p ⁵ 9s	ζ _{4p}	9998	9998	1.000	F
	G ¹ (4p,9s)	375	337	0.900	F
	E _{av}	626415	610078		
4p ⁵ 10s	ζ _{4p}	10001	10001	1.000	F
	G ¹ (4p,10s)	247	222	0.900	F
	E _{av}	558379	542891		

Table A.2. continued.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
4p ⁵ 6g	ζ_{4p}	10004	10394	1.039	
	ζ_{5g}	0.8	0.8	1.000	F
	F ² (4p,5g)	4855	4142	0.853	R6
	G ³ (4p,5g)	392	335	0.853	R6
	G ⁵ (4p,5g)	277	236	0.853	R6
	E _{av}	592345	576588		
	ζ_{4p}	10004	10388	1.038	
	ζ_{6g}	0.4	0.4	1.000	F
	F ² (4p,6g)	2776	2436	0.877	R7
	G ³ (4p,6g)	358	314	0.877	R7
4s4p ⁶ 5p	G ⁵ (4p,6g)	253	222	0.877	R7
	E _{av}	629514	612875		
	ζ_{5p}	1879	1879	1.000	F
4p ⁵ 4d–4p ⁵ 5s	G ¹ (4s,5p)	6870	6183	0.900	F
	R ² (4p4d;4p5s)	-8924	-5044	0.565	R8
	R ¹ (4p4d;4p5s)	-1482	-837	0.565	R8

^a F: Fixed parameter value; Rn: ratios of these parameters have been fixed in the fitting process

Table A.3. Radial parameters (in cm⁻¹) adopted for the calculations in Zr VI.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Odd parity					
4p ⁵	E _{av}	22997	23322		
4p ⁴ 5p	ζ_{4p}	10007	10580	1.057	
	E _{av}	461912	446765		
	F ² (4p,4p)	84088	79559	0.946	
	α	0	-651		
	ζ_{4p}	10577	10907	1.031	
	ζ_{5p}	2382	2701	1.134	
	F ² (4p,5p)	26052	21472	0.824	
	G ⁰ (4p,5p)	5535	4696	0.848	
	G ² (4p,5p)	7459	6664	0.893	
Even parity					
4s4p ⁶	E _{av}	251206	224383		
4p ⁴ 4d	E _{av}	289403	291464		
	F ² (4p,4p)	82744	78447	0.948	
	α	0	-450		
	ζ_{4p}	10187	10521	1.033	
	ζ_{4d}	721	854	1.184	
	F ² (4p,4d)	69677	62179	0.892	
	G ¹ (4p,4d)	86802	72077	0.831	
	G ³ (4p,4d)	53829	45721	0.849	
4p ⁴ 5d	E _{av}	536543	535860		
	F ² (4p,4p)	84140	77928	0.926	
	α	0	-450		F
	ζ_{4p}	10569	10891	1.030	
	ζ_{5d}	217	259	1.191	
	F ² (4p,5d)	19555	16945	0.867	
	G ¹ (4p,5d)	10870	8250	0.759	R1
	G ³ (4p,5d)	8037	6100	0.759	R1
4p ⁴ 5s	E _{av}	386802	387950		
	F ² (4p,4p)	83739	79833	0.953	
	α	0	-665		
	ζ_{4p}	10498	10846	1.033	
	G ¹ (4p,5s)	8725	7618	0.873	
4p ⁴ 6s	E _{av}	564837	564005		

Table A.3. continued.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
	F ² (4p,4p)	84213	81311	0.965	
	α	0	-332		
	ζ_{4p}	10600	11164	1.053	
	G ¹ (4p,6s)	2787	2372	0.851	
4s4p ⁶ –4p ⁴ 4d	R ¹ (4p4p;4s4d)	96078	72916	0.759	R2
4s4p ⁶ –4p ⁴ 5d	R ¹ (4p4p;4s5d)	32299	24513	0.759	R2

^a F: Fixed parameter value; Rn: ratios of these parameters have been fixed in the fitting process.

Table A.4. Radial parameters (in cm⁻¹) adopted for the calculations in Zr VII.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Even parity					
4p ⁴	E _{av}	23653	33968		
	F ² (4p,4p)	84430	65839	0.780	
	α	0	646		
4p ³ 5p	ζ_{4p}	10658	11259	1.056	
	E _{av}	516191	514481		
	F ² (4p,4p)	86163	82914	0.962	
	α	0	-537		
	ζ_{4p}	11232	11776	1.048	
	ζ_{5p}	2920	2920	1.000	F
	F ² (4p,5p)	29125	29164	1.001	
	G ⁰ (4p,5p)	6338	6086	0.960	
	G ² (4p,5p)	8477	5272	0.622	
Odd parity					
4s4p ⁵	E _{av}	246126	238581		
	ζ_{4p}	10648	11005	1.034	
	G ¹ (4s,4p)	112472	98647	0.877	
4p ³ 4d	E _{av}	320698	319713		
	F ² (4p,4p)	84870	81614	0.962	
	α	0	-508		
	ζ_{4p}	10822	11010	1.017	
	ζ_{4d}	824	795	0.964	
	F ² (4p,4d)	73259	69858	0.954	
	G ¹ (4p,4d)	91609	77513	0.846	
	G ³ (4p,4d)	57095	48489	0.849	
4p ³ 5s	E _{av}	448971	447229		
	F ² (4p,4p)	85823	80727	0.941	
	α	0	-667		
	ζ_{4p}	11148	11790	1.058	
4s4p ⁵ –4p ³ 4d	G ¹ (4p,5s)	9475	8104	0.855	
	R ¹ (4p4p;4s4d)	100074	78158	0.781	

^a F: Fixed parameter value.

Table A.5. Comparison between available experimental and calculated energy levels in Zr IV. Energies are given in cm⁻¹.

E _{exp} ^a	E _{calc} ^b	ΔE	J	Leading components (in %) in <i>LS</i> coupling ^c
Even parity				
0.00	0000	0	1.5	99 4d ² D
1250.70	1251	0	2.5	99 4d ² D
38258.35	38258	0	0.5	99 5s ² S
146652.40	146652	0	1.5	100 5d ² D

Table A.5. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
147002.46	147002	0	2.5	100 5d ² D
152513.00	152513	0	0.5	100 6s ² S
197765.10	197765	0	1.5	100 6d ² D
197930.43	197930	0	2.5	100 6d ² D
200123.69	200124	0	0.5	100 7s ² S
206864.42	206863	0	3.5	100 5g ² G
206864.68	206866	-1	4.5	100 5g ² G
224813.48	224813	0	0.5	100 8s ² S
228479.86	228479	0	3.5	100 6g ² G
228480.08	228480	0	4.5	100 6g ² G
241526.36	241526	0	3.5	100 7g ² G
241526.52	241527	0	4.5	100 7g ² G
249995.33	249995	0	3.5	100 8g ² G
249995.44	249996	0	4.5	100 8g ² G
255800.20	255801	-1	3.5	100 9g ² G
255801.50	255801	1	4.5	100 9g ² G
				Odd parity
81976.50	81976	0	0.5	99 5p ² P
84461.35	84461	0	1.5	99 5p ² P
159066.75	159041	26	2.5	98 4f ² F
159086.91	159112	-25	3.5	98 4f ² F
169809.71	169810	0	0.5	100 6p ² P
170815.11	170815	0	1.5	100 6p ² P
201114.14	201105	9	2.5	97 5f ² F
201162.65	201171	-9	3.5	97 5f ² F
208783.36	208783	0	0.5	100 7p ² P
209297.66	209298	0	1.5	100 7p ² P
224419.90	224425	-5	2.5	96 6f ² F
224488.11	224483	5	3.5	97 6f ² F
228743.87	228744	0	4.5	100 6h ² H
228743.87	228744	0	5.5	100 6h ² H

^(a) From Reader & Acquista (1997).^(b) This work.Table A.6. Comparison between available experimental and calculated energy levels in Zr v. Energies are given in cm⁻¹.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
				Even parity
0.00	0	0	0	97 4p ⁶ ¹ S
371895.16	372099	-204	1	84 4p ⁵ 5p ³ S + 13 4p ⁵ 5p ³ P
376897.68	376807	91	2	57 4p ⁵ 5p ³ D + 36 4p ⁵ 5p ¹ D + 7 4p ⁵ 5p ³ P
378753.36	378653	100	3	99 4p ⁵ 5p ³ D
380855.53	380904	-48	1	46 4p ⁵ 5p ¹ P + 30 4p ⁵ 5p ³ D + 20 4p ⁵ 5p ³ P
382985.08	382952	33	2	67 4p ⁵ 5p ³ P + 30 4p ⁵ 5p ¹ D
388852.95	388865	-12	0	77 4p ⁵ 5p ³ P + 22 4p ⁵ 5p ¹ S
391998.41	392073	-75	1	64 4p ⁵ 5p ³ D + 33 4p ⁵ 5p ¹ P
395994.98	395944	51	2	40 4p ⁵ 5p ³ D + 33 4p ⁵ 5p ¹ D + 25 4p ⁵ 5p ³ P
396300.35	396396	-96	1	64 4p ⁵ 5p ³ P + 19 4p ⁵ 5p ¹ P + 11 4p ⁵ 5p ³ S
402688.40	402529	160	0	76 4p ⁵ 5p ¹ S + 22 4p ⁵ 5p ³ P
434714.60	434703	12	1	55 4s4p ⁶ 4d ³ D + 31 4p ⁵ 4f ³ D + 8 4p ⁴ 4d ² ³ D
435759.10	435755	4	2	56 4s4p ⁶ 4d ³ D + 29 4p ⁵ 4f ³ D + 8 4p ⁴ 4d ² ³ D
437678.10	437641	38	3	58 4s4p ⁶ 4d ³ D + 25 4p ⁵ 4f ³ D + 9 4p ⁴ 4d ² ³ D
450133.70	450156	-22	2	49 4s4p ⁶ 4d ¹ D + 19 4p ⁴ 4d ² ¹ D + 18 4p ⁵ 4f ¹ D
453680.80	453610	71	5	94 4p ⁵ 4f ³ G

Table A.6. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
454538.80	454537	1	4	59 4p ⁵ 4f ³ G + 33 4p ⁵ 4f ¹ G
457546.70	457482	65	3	43 4p ⁵ 4f ³ G + 29 4p ⁵ 4f ¹ F + 22 4p ⁵ 4f ³ F
458432.20	458479	-47	4	54 4p ⁵ 4f ³ F + 31 4p ⁵ 4f ¹ G + 8 4p ⁵ 4f ³ G
460476.90	460554	-77	1	62 4p ⁵ 4f ³ D + 18 4s4p ⁶ 4d ³ D + 10 4p ⁴ 4d ² ³ D
460694.10	460714	-20	2	42 4p ⁵ 4f ³ D + 27 4p ⁵ 4f ³ F + 14 4s4p ⁶ 4d ³ D
460767.50	460886	-119	3	28 4p ⁵ 4f ³ D + 27 4p ⁵ 4f ³ F + 21 4p ⁵ 4f ¹ F
464015.40	463932	83	2	32 4p ⁵ 4f ³ F + 31 4p ⁵ 4f ¹ D + 15 4s4p ⁶ 4d ¹ D
470773.50	470677	96	3	50 4p ⁵ 4f ³ G + 25 4p ⁵ 4f ¹ F + 18 4p ⁵ 4f ³ F
471762.40	471785	-22	4	37 4p ⁵ 4f ³ F + 30 4p ⁵ 4f ¹ G + 26 4p ⁵ 4f ³ G
473715.40	473766	-51	3	40 4p ⁵ 4f ³ D + 26 4p ⁵ 4f ³ F + 19 4p ⁵ 4f ¹ F
476130.20	476166	-35	2	46 4p ⁵ 4f ¹ D + 31 4p ⁵ 4f ³ F + 11 4p ⁵ 4f ³ D
491116.00	491414	-298	1	78 4p ⁵ 6p ³ S + 16 4p ⁵ 6p ³ P
494472.00	495996	-1524	1	55 4p ⁵ 6p ¹ P + 22 4p ⁵ 6p ³ P + 21 4p ⁵ 6p ³ D
494760.00	494729	31	3	99 4p ⁵ 6p ³ D
495912.00	494141	1771	2	52 4p ⁵ 6p ³ D + 41 4p ⁵ 6p ¹ D + 6 4p ⁵ 6p ³ P
496428.00	496722	-294	2	73 4p ⁵ 6p ³ P + 24 4p ⁵ 6p ¹ D
499459.00	498891	568	0	55 4p ⁵ 6p ¹ S + 42 4p ⁵ 6p ³ P
509310.00	509042	268	1	67 4p ⁵ 6p ³ D + 30 4p ⁵ 6p ¹ P
510066.00	510179	-113	1	60 4p ⁵ 6p ³ P + 13 4p ⁵ 6p ³ S + 12 4p ⁵ 6p ¹ P
510942.00	511814	-872	0	57 4p ⁵ 6p ³ P + 38 4p ⁵ 6p ¹ S
511263.00	510586	677	2	45 4p ⁵ 6p ³ D + 33 4p ⁵ 6p ¹ D + 21 4p ⁵ 6p ³ P
				Odd parity
241381.30	241649	-268	0	99 4p ⁵ 4d ³ P
243560.80	243779	-218	1	97 4p ⁵ 4d ³ P
247962.30	248100	-138	2	91 4p ⁵ 4d ³ P + 6 4p ⁵ 4d ³ D
251283.30	250854	429	4	99 4p ⁵ 4d ³ F
253753.40	253327	426	3	87 4p ⁵ 4d ³ F + 8 4p ⁵ 4d ¹ F + 5 4p ⁵ 4d ³ D
257361.30	257118	243	2	75 4p ⁵ 4d ³ F + 14 4p ⁵ 4d ¹ D + 10 4p ⁵ 4d ³ D
265845.50	266213	-367	3	65 4p ⁵ 4d ³ D + 35 4p ⁵ 4d ¹ F
270560.80	270736	-176	2	49 4p ⁵ 4d ¹ D + 26 4p ⁵ 4d ³ D + 24 4p ⁵ 4d ³ F
271601.60	271544	57	1	96 4p ⁵ 4d ³ D
274654.60	274810	-155	2	57 4p ⁵ 4d ³ D + 34 4p ⁵ 4d ¹ D + 8 4p ⁵ 4d ³ P
277145.50	276979	166	3	57 4p ⁵ 4d ¹ F + 30 4p ⁵ 4d ³ D + 13 4p ⁵ 4d ³ F
325014.87	325066	-52	2	99 4p ⁵ 5s ³ P
327616.99	327532	85	1	38 4p ⁵ 5s ¹ P + 34 4p ⁵ 5s ³ P + 25 4p ⁵ 4d ¹ P
328940.75	328971	-30	1	68 4p ⁵ 4d ¹ P + 15 4p ⁵ 5s ³ P + 12 4p ⁵ 5s ¹ P
340315.49	340258	57	0	99 4p ⁵ 5s ³ P
342245.65	342305	-60	1	50 4p ⁵ 5s ³ P + 49 4p ⁵ 5s ¹ P
452938.91	452953	-14	0	99 4p ⁵ 5d ³ P
453905.60	453911	-5	1	89 4p ⁵ 5d ³ P + 10 4p ⁵ 5d ³ D
455444.40	455398	47	4	99 4p ⁵ 5d ³ F
455630.80	455629	2	2	66 4p ⁵ 5d ³ P + 24 4p ⁵ 5d ³ D + 9 4p ⁵ 5d ¹ D
455925.27	455941	-16	3	60 4p ⁵ 5d ³ F + 34 4p ⁵ 5d ¹ F + 5 4p ⁵ 5d ³ D
457613.10	457595	18	2	44 4p ⁵ 5d ¹ D + 31 4p ⁵ 5d ³ F + 23 4p ⁵ 5d ³ D
458523.70	458496	28	3	66 4p ⁵ 5d ³ D + 30 4p ⁵ 5d ¹ F
462307.40	462375	-68	1	56 4p ⁵ 5d ³ D + 37 4p ⁵ 5d ¹ P
471306.30	471306	0	2	66 4p ⁵ 5d ³ F + 25 4p ⁵ 5d ¹ D + 7 4p ⁵ 5d ³ D
472015.28	472047	-31	2	41 4p ⁵ 5d ³ D + 28 4p ⁵ 5d ³ P + 18 4p ⁵ 5d ¹ D
472338.00	472335	3	2	89 4p ⁵ 6s ³ P
472520.00	472529	-9	3	36 4p ⁵ 5d ³ F + 35 4p ⁵ 5d ¹ F + 28 4p ⁵ 5d ³ D
473172.70	473173	-1	1	61 4p ⁵ 6s ¹ P + 36 4p ⁵ 6s ³ P
476477.40	476432	45	1	56 4p ⁵ 5d ¹ P + 32 4p ⁵ 5d ³ D + 6 4p ⁵ 5d ³ P
487746.60	487747	0	0	100 4p ⁵ 6s ³ P
488292.70	488292	0	1	62 4p ⁵ 6s ³ P + 38 4p ⁵ 6s ¹ P
528422.80	528711	-288	1	83 4p ⁵ 6d ³ P + 15 4p ⁵ 6d ³ D
529161.60	529325	-163	4	100 4p ⁵ 6d ³ F

Table A.6. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
529283.30	529342	-59	2	54 $4p^5 6d^3 P$ + 33 $4p^5 6d^3 D$ + 11 $4p^5 6d^1 D$
529299.60	529363	-63	3	52 $4p^5 6d^3 F$ + 44 $4p^5 6d^1 F$
530119.70	529936	183	2	51 $4p^5 6d^1 D$ + 24 $4p^5 6d^3 F$ + 23 $4p^5 6d^3 D$
530465.50	530165	300	3	72 $4p^5 6d^3 D$ + 22 $4p^5 6d^1 F$ + 5 $4p^5 6d^3 F$
531839.00	531753	86	1	56 $4p^5 6d^1 P$ + 39 $4p^5 6d^3 D$
536682.20	536674	8	2	100 $4p^5 5g^3 F$
536731.50	536723	9	3	60 $4p^5 5g^3 F$ + 39 $4p^5 5g^1 F$
536763.90	536761	3	2	100 $4p^5 7s^3 P$
536961.40	536976	-14	6	100 $4p^5 5g^3 H$
536983.90	536996	-12	5	53 $4p^5 5g^1 H$ + 46 $4p^5 5g^3 H$
537213.40	537217	-4	1	64 $4p^5 7s^1 P$ + 35 $4p^5 7s^3 P$
537501.90	537499	3	4	46 $4p^5 5g^3 F$ + 30 $4p^5 5g^3 G$ + 24 $4p^5 5g^1 G$
537539.20	537528	11	3	54 $4p^5 5g^3 G$ + 29 $4p^5 5g^1 F$ + 17 $4p^5 5g^3 F$
537806.70	537807	-1	4	39 $4p^5 5g^1 G$ + 31 $4p^5 5g^3 G$ + 30 $4p^5 5g^3 H$
537816.50	537820	-3	5	70 $4p^5 5g^3 G$ + 15 $4p^5 5g^3 H$ + 14 $4p^5 5g^1 H$
546323.00	546325	-2	1	46 $4p^5 6d^3 D$ + 41 $4p^5 6d^1 P$ + 12 $4p^5 6d^3 P$
552258.20	552265	-7	0	100 $4p^5 7s^3 P$
552521.10	552515	6	1	64 $4p^5 7s^3 P$ + 35 $4p^5 7s^1 P$
552878.20	552884	-6	4	66 $4p^5 5g^3 H$ + 26 $4p^5 5g^1 G$ + 5 $4p^5 5g^3 G$
552894.50	552889	5	4	50 $4p^5 5g^3 F$ + 34 $4p^5 5g^3 G$ + 11 $4p^5 5g^1 G$
552894.70	552905	-10	5	38 $4p^5 5g^3 H$ + 32 $4p^5 5g^1 H$ + 30 $4p^5 5g^3 G$
552933.50	552923	11	3	46 $4p^5 5g^3 G$ + 31 $4p^5 5g^1 F$ + 23 $4p^5 5g^3 F$
568040.00	567226	814	1	74 $4p^5 7d^3 P$ + 10 $4p^5 7d^3 D$ + 10 $4s 4p^6 5p^3 P$
570779.30	570772	7	2	100 $4p^5 6g^3 F$
570828.20	570823	5	3	63 $4p^5 6g^3 F$ + 37 $4p^5 6g^1 F$
570946.50	570957	-11	6	100 $4p^5 6g^3 H$
570967.60	570977	-9	5	53 $4p^5 6g^1 H$ + 47 $4p^5 6g^3 H$
571271.70	571267	4	4	44 $4p^5 6g^3 F$ + 31 $4p^5 6g^3 G$ + 25 $4p^5 6g^1 G$
571306.30	571301	5	3	55 $4p^5 6g^3 G$ + 31 $4p^5 6g^1 F$ + 13 $4p^5 6g^3 F$
571376.00	571674	-298	1	64 $4p^5 8s^1 P$ + 34 $4p^5 8s^3 P$
571443.60	571444	0	4	40 $4p^5 6g^1 G$ + 32 $4p^5 6g^3 G$ + 28 $4p^5 6g^3 H$
571452.20	571454	-2	5	71 $4p^5 6g^3 G$ + 14 $4p^5 6g^3 H$ + 14 $4p^5 6g^1 H$
573776.00	573860	-84	1	59 $4s 4p^6 5p^3 P$ + 19 $4p^4 4d 5p^3 P$ + 9 $4p^5 7d^3 P$
583420.00	584144	-724	1	44 $4p^5 7d^3 D$ + 37 $4p^5 7d^1 P$ + 14 $4p^5 7d^3 P$
586704.90	586704	0	4	55 $4p^5 6g^3 F$ + 22 $4p^5 6g^3 G$ + 22 $4p^5 6g^1 G$
586718.20	586718	0	4	71 $4p^5 6g^3 H$ + 15 $4p^5 6g^3 G$ + 13 $4p^5 6g^1 G$
586734.50	586735	-1	5	39 $4p^5 6g^3 H$ + 33 $4p^5 6g^1 H$ + 28 $4p^5 6g^3 G$
586882.00	586588	294	1	65 $4p^5 8s^3 P$ + 34 $4p^5 8s^1 P$
591916.00	591916	0	1	66 $4p^5 9s^1 P$ + 34 $4p^5 9s^3 P$
605118.00	605118	0	1	66 $4p^5 10s^1 P$ + 34 $4p^5 10s^3 P$

(a) From Reader & Acquista (1979) and Khan et al. (1981).

(b) This work.

(c) Only the first three components that are larger than 5% are given.

Table A.7. Comparison between available experimental and calculated energy levels in Zr vi. Energies are given in cm^{-1} .

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
Odd parity				
0.00	0	0	1.5	97 $4p^5^2 P$
15602.78	15603	0	0.5	97 $4p^5^2 P$
421257.96	421364	-106	1.5	62 $4p^4(^3P)5p^4 P$ + 9 $4p^4(^3P)5p^4 S$ + 9 $4p^4(^1D)5p^2 P$
421991.19	421898	93	2.5	68 $4p^4(^3P)5p^4 P$ + 23 $4p^4(^3P)5p^4 D$
425678.16	426017	-339	0.5	23 $4p^4(^3P)5p^2 P$ + 44 $4p^4(^3P)5p^4 P$ + 19 $4p^4(^1D)5p^2 P$
427118.65	427134	-15	2.5	60 $4p^4(^3P)5p^2 D$ + 14 $4p^4(^3P)5p^4 P$ + 13 $4p^4(^3P)5p^4 D$
427649.11	427421	228	3.5	89 $4p^4(^3P)5p^4 D$ + 10 $4p^4(^1D)5p^2 F$

Table A.7. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
434797.76	434744	53	0.5	$39\ 4p^4(^3P)5p\ ^4P + 22\ 4p^4(^3P)5p\ ^4D + 18\ 4p^4(^3P)5p\ ^2P$
435427.69	435124	304	1.5	$33\ 4p^4(^3P)5p\ ^4D + 18\ 4p^4(^3P)5p\ ^2P + 22\ 4p^4(^3P)5p\ ^2D$
436859.11	436770	89	0.5	$60\ 4p^4(^3P)5p\ ^4D + 14\ 4p^4(^3P)5p\ ^2S + 13\ 4p^4(^3P)5p\ ^4P$
437477.01	437605	-128	1.5	$48\ 4p^4(^3P)5p\ ^4D + 32\ 4p^4(^3P)5p\ ^2P + 10\ 4p^4(^1D)5p\ ^2P$
440554.88	440364	191	2.5	$59\ 4p^4(^3P)5p\ ^4D + 25\ 4p^4(^3P)5p\ ^2D + 13\ 4p^4(^3P)5p\ ^4P$
442453.66	442488	-34	1.5	$28\ 4p^4(^3P)5p\ ^2D + 24\ 4p^4(^3P)5p\ ^4S + 15\ 4p^4(^3P)5p\ ^4P$
444340.07	444700	-360	0.5	$67\ 4p^4(^3P)5p\ ^2S + 13\ 4p^4(^3P)5p\ ^2P + 10\ 4p^4(^3P)5p\ ^4D$
444879.34	444961	-82	1.5	$45\ 4p^4(^3P)5p\ ^4S + 42\ 4p^4(^3P)5p\ ^2D + 5\ 4p^4(^3P)5p\ ^4P$
449730.72	449653	77	2.5	$83\ 4p^4(^1D)5p\ ^2F + 8\ 4p^4(^3P)5p\ ^2D$
452999.87	452910	90	3.5	$88\ 4p^4(^1D)5p\ ^2F + 10\ 4p^4(^3P)5p\ ^4D$
455878.16	455971	-92	1.5	$57\ 4p^4(^1D)5p\ ^2P + 21\ 4p^4(^1D)5p\ ^2D + 9\ 4p^4(^3P)5p\ ^2P$
459077.64	459024	54	1.5	$70\ 4p^4(^1D)5p\ ^2D + 19\ 4p^4(^3P)5p\ ^2P + 8\ 4p^4(^1D)5p\ ^2P$
459580.77	459640	-60	2.5	$89\ 4p^4(^1D)5p\ ^2D$
464724.05	464719	5	0.5	$61\ 4p^4(^1D)5p\ ^2P + 34\ 4p^4(^3P)5p\ ^2P$
482699.28	482631	68	0.5	$78\ 4p^4(^1S)5p\ ^2P + 9\ 4p^4(^3P)5p\ ^2P + 7\ 4p^4(^3P)5p\ ^4D$
484897.26	484977	-80	1.5	$41\ 4p^4(^1S)5p\ ^2P + 29\ 4s4p^54d\ ^2D + 8\ 4p^4(^1D)4f\ ^2D$
				Even parity
191570.67	191601	-30	0.5	$79\ 4s4p^6\ ^2S + 21\ 4p^4(^1D)4d\ ^2S$
248940.11	248835	105	2.5	$88\ 4p^4(^3P)4d\ ^4D$
249322.89	249299	24	3.5	$90\ 4p^4(^3P)4d\ ^4D + 6\ 4p^4(^3P)4d\ ^4F$
250017.63	249918	99	1.5	$85\ 4p^4(^3P)4d\ ^4D$
251818.70	251917	-98	0.5	$85\ 4p^4(^3P)4d\ ^4D + 6\ 4p^4(^1D)4d\ ^2P + 5\ 4p^4(^3P)4d\ ^2P$
261642.90	261178	465	4.5	$89\ 4p^4(^3P)4d\ ^4F + 10\ 4p^4(^1D)4d\ ^2G$
266145.41	265622	523	3.5	$65\ 4p^4(^3P)4d\ ^4F + 17\ 4p^4(^3P)4d\ ^2F + 13\ 4p^4(^1D)4d\ ^2G$
266278.49	267703	-1.425	0.5	$43\ 4p^4(^1D)4d\ ^2P + 37\ 4p^4(^3P)4d\ ^2P + 14\ 4p^4(^3P)4d\ ^4D$
271296.05	270956	340	1.5	$60\ 4p^4(^3P)4d\ ^4F + 12\ 4p^4(^1S)4d\ ^2D + 10\ 4p^4(^3P)4d\ ^4P$
271374.36	270685	689	2.5	$92\ 4p^4(^3P)4d\ ^4F$
272091.26	272252	-161	0.5	$90\ 4p^4(^3P)4d\ ^4P$
272834.44	273006	-172	1.5	$45\ 4p^4(^3P)4d\ ^4P + 23\ 4p^4(^3P)4d\ ^4F + 18\ 4p^4(^1D)4d\ ^2P$
274665.60	274850	-184	1.5	$38\ 4p^4(^1D)4d\ ^2D + 23\ 4p^4(^3P)4d\ ^2D + 10\ 4p^4(^3P)4d\ ^2P$
276491.34	276497	-6	3.5	$42\ 4p^4(^3P)4d\ ^2F + 25\ 4p^4(^3P)4d\ ^4F + 20\ 4p^4(^1D)4d\ ^2G$
278742.23	278849	-107	2.5	$73\ 4p^4(^3P)4d\ ^4P + 9\ 4p^4(^1S)4d\ ^2D + 7\ 4p^4(^3P)4d\ ^2F$
279457.21	280229	-772	1.5	$39\ 4p^4(^3P)4d\ ^4P + 24\ 4p^4(^1D)4d\ ^2P + 22\ 4p^4(^3P)4d\ ^2P$
283112.00	283096	16	2.5	$38\ 4p^4(^1S)4d\ ^2D + 20\ 4p^4(^3P)4d\ ^2D + 19\ 4p^4(^3P)4d\ ^4P$
285967.09	285408	559	3.5	$65\ 4p^4(^1D)4d\ ^2G + 23\ 4p^4(^3P)4d\ ^2F + 9\ 4p^4(^1D)4d\ ^2F$
286411.50	285745	666	4.5	$89\ 4p^4(^1D)4d\ ^2G + 10\ 4p^4(^3P)4d\ ^4F$
287142.42	287582	-440	2.5	$61\ 4p^4(^3P)4d\ ^2F + 20\ 4p^4(^1D)4d\ ^2F + 11\ 4p^4(^1D)4d\ ^2D$
299608.66	299907	-298	2.5	$76\ 4p^4(^1D)4d\ ^2F + 12\ 4p^4(^3P)4d\ ^2F + 9\ 4p^4(^1D)4d\ ^2D$
303517.22	303778	-260	3.5	$80\ 4p^4(^1D)4d\ ^2F + 16\ 4p^4(^3P)4d\ ^2F$
319336.18	319348	-11	1.5	$62\ 4p^4(^1S)4d\ ^2D + 25\ 4p^4(^1D)4d\ ^2D$
325576.82	325455	121	2.5	$72\ 4p^4(^1S)4d\ ^2D + 13\ 4p^4(^1D)4d\ ^2D + 5\ 4p^4(^3P)4d\ ^2F$
334694.92	334643	52	0.5	$70\ 4p^4(^1D)4d\ ^2S + 18\ 4s4p^6\ ^2S + 5\ 4p^4(^1D)4d\ ^2P$
339682.78	339148	535	1.5	$49\ 4p^4(^3P)4d\ ^2P + 36\ 4p^4(^1D)4d\ ^2P + 7\ 4p^4(^1D)4d\ ^2D$
343709.55	344545	-835	2.5	$64\ 4p^4(^3P)4d\ ^2D + 22\ 4p^4(^1D)4d\ ^2D + 10\ 4p^4(^1S)4d\ ^2D$
346345.56	345413	932	0.5	$47\ 4p^4(^3P)4d\ ^2P + 41\ 4p^4(^1D)4d\ ^2P + 8\ 4p^4(^1D)4d\ ^2S$
358168.09	358487	-319	1.5	$56\ 4p^4(^3P)4d\ ^2D + 18\ 4p^4(^1S)4d\ ^2D + 15\ 4p^4(^1D)4d\ ^2D$
364827.11	364808	19	2.5	$91\ 4p^4(^3P)5s\ ^4P + 8\ 4p^4(^1D)5s\ ^2D$
369711.65	369710	1	1.5	$51\ 4p^4(^3P)5s\ ^2P + 38\ 4p^4(^3P)5s\ ^4P + 10\ 4p^4(^1D)5s\ ^2D$
377452.05	377510	-58	0.5	$90\ 4p^4(^3P)5s\ ^4P + 9\ 4p^4(^1S)5s\ ^2S$
379776.65	379721	55	1.5	$60\ 4p^4(^3P)5s\ ^4P + 36\ 4p^4(^3P)5s\ ^2P$
384781.44	384805	-23	0.5	$93\ 4p^4(^3P)5s\ ^2P + 5\ 4p^4(^1S)5s\ ^2S$
393555.34	393558	-3	2.5	$91\ 4p^4(^1D)5s\ ^2D + 7\ 4p^4(^3P)5s\ ^4P$
394195.47	394194	1	1.5	$86\ 4p^4(^1D)5s\ ^2D + 12\ 4p^4(^3P)5s\ ^2P$
423223.46	423216	7	0.5	$83\ 4p^4(^1S)5s\ ^2S + 8\ 4p^4(^3P)5s\ ^4P + 6\ 4p^4(^3P)5s\ ^2P$
514465.31	514326	140	2.5	$71\ 4p^4(^3P)5d\ ^4D + 10\ 4p^4(^3P)5d\ ^4F + 9\ 4p^4(^3P)5d\ ^4P$
514487.01	514344	143	3.5	$73\ 4p^4(^3P)5d\ ^4D + 18\ 4p^4(^3P)5d\ ^4F + 6\ 4p^4(^1D)5d\ ^2F$
515170.73	515071	100	1.5	$60\ 4p^4(^3P)5d\ ^4D + 19\ 4p^4(^3P)5d\ ^4P + 6\ 4p^4(^1D)5d\ ^2D$

Table A.7. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
516443.48	516466	-22	0.5	45 $4p^4(^3P)5d^4D$ + 25 $4p^4(^3P)5d^4P$ + 17 $4p^4(^3P)5d^2P$
518061.55	517912	150	3.5	64 $4p^4(^3P)5d^2F$ + 23 $4p^4(^3P)5d^4F$ + 11 $4p^4(^1D)5d^2G$
521740.06	521926	-186	1.5	38 $4p^4(^3P)5d^4D$ + 34 $4p^4(^3P)5d^2D$ + 12 $4p^4(^3P)5d^2P$
522035.99	522139	-103	2.5	39 $4p^4(^3P)5d^2D$ + 25 $4p^4(^3P)5d^2F$ + 15 $4p^4(^3P)5d^4P$
528357.52	528376	-19	0.5	50 $4p^4(^3P)5d^4D$ + 31 $4p^4(^3P)5d^2P$ + 9 $4p^4(^1D)5d^2P$
528976.13	528735	241	1.5	69 $4p^4(^3P)5d^4F$ + 11 $4p^4(^1S)5d^2D$ + 11 $4p^4(^3P)5d^4D$
529351.71	529095	257	2.5	58 $4p^4(^3P)5d^4F$ + 14 $4p^4(^3P)5d^4P$ + 12 $4p^4(^3P)5d^4D$
529945.22	529724	222	3.5	54 $4p^4(^3P)5d^4F$ + 23 $4p^4(^3P)5d^2F$ + 21 $4p^4(^3P)5d^4D$
530538.91	530420	119	1.5	28 $4p^4(^3P)5d^4P$ + 25 $4p^4(^3P)5d^4D$ + 20 $4p^4(^3P)5d^2D$
532402.86	532261	142	2.5	52 $4p^4(^3P)5d^4P$ + 29 $4p^4(^3P)5d^2F$ + 11 $4p^4(^3P)5d^4F$
533736.95	533652	85	2.5	44 $4p^4(^3P)5d^2D$ + 39 $4p^4(^3P)5d^2F$
534552.78	534821	-268	1.5	64 $4p^4(^3P)5d^2P$ + 15 $4p^4(^3P)5d^2D$ + 8 $4p^4(^1D)5d^2P$
543295.84	543372	-77	0.5	79 $4p^4(^1D)5d^2S$ + 10 $4p^4(^3P)5d^4P$ + 9 $4p^4(^1D)5d^2P$
544423.00	544411	12	1.5	73 $4p^4(^1D)5d^2P$ + 8 $4p^4(^3P)6s^2P$ + 7 $4p^4(^3P)5d^4P$
545413.52	545407	7	2.5	90 $4p^4(^3P)6s^4P$ + 8 $4p^4(^1D)6s^2D$
545666.07	545943	-277	2.5	74 $4p^4(^1D)5d^2D$ + 16 $4p^4(^1D)5d^2F$
547213.94	547484	-270	2.5	74 $4p^4(^1D)5d^2F$ + 14 $4p^4(^1D)5d^2D$ + 7 $4p^4(^3P)5d^2D$
547471.92	547470	2	1.5	63 $4p^4(^3P)6s^2P$ + 20 $4p^4(^3P)6s^4P$ + 8 $4p^4(^1D)6s^2D$
547791.00	548110	-319	0.5	66 $4p^4(^1D)5d^2P$ + 23 $4p^4(^3P)5d^2P$ + 7 $4p^4(^1D)5d^2S$
548805.54	549467	-661	1.5	78 $4p^4(^1D)5d^2D$ + 18 $4p^4(^3P)5d^2D$
558208.73	558215	-6	0.5	86 $4p^4(^3P)6s^4P$ + 12 $4p^4(^1S)6s^2S$
559356.47	559344	13	1.5	78 $4p^4(^3P)6s^4P$ + 22 $4p^4(^3P)6s^2P$
561050.32	561062	-11	0.5	92 $4p^4(^3P)6s^2P$
573101.84	572669	433	2.5	82 $4p^4(^1S)5d^2D$
573301.14	573148	153	1.5	79 $4p^4(^1S)5d^2D$ + 6 $4p^4(^3P)5d^4F$
574494.88	574600	-105	2.5	92 $4p^4(^1D)6s^2D$ + 8 $4p^4(^3P)6s^4P$
574889.14	574785	105	1.5	89 $4p^4(^1D)6s^2D$ + 8 $4p^4(^3P)6s^2P$
602661.00	602660	1	0.5	83 $4p^4(^1S)6s^2S$ + 10 $4p^4(^3P)6s^4P$ + 5 $4p^4(^3P)6s^2P$

^(a) From Reader & Lindsay (2016).^(b) This work.^(c) Only the first three components that are larger than 5% are given.Table A.8. Comparison between available experimental and calculated energy levels in Zr VII. Energies are given in cm^{-1} .

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
Even parity				
0	2	-2	2	89 $4p^4^3P$ + 9 $4p^4^1D$
12557	12554	3	0	83 $4p^4^3P$ + 14 $4p^4^1S$
13549	13550	-1	1	97 $4p^4^3P$
27176	27176	0	2	88 $4p^4^1D$ + 9 $4p^4^3P$
56943	56943	0	0	84 $4p^4^1S$ + 14 $4p^4^3P$
480659	480829	-170	1	53 $4p^3(^4S)5p^3P$ + 11 $4p^3(^4S)5p^5P$ + 8 $4p^3(^2D)5p^3P$
483891	484629	-738	2	61 $4p^3(^4S)5p^3P$ + 17 $4p^3(^4S)5p^5P$ + 7 $4p^3(^2D)5p^3P$
485937	484685	1252	0	84 $4p^3(^4S)5p^3P$ + 7 $4p^3(^2P)5p^3P$ + 6 $4p^3(^2D)5p^3P$
492000	494297	-2297	1	33 $4p^3(^2D)5p^1P$ + 30 $4p^3(^2D)5p^3D$ + 12 $4p^3(^4S)5p^3P$
498029	498816	-787	2	48 $4p^3(^2D)5p^3F$ + 27 $4p^3(^2D)5p^3D$ + 11 $4p^3(^2P)5p^3D$
501798	502258	-460	3	64 $4p^3(^2D)5p^3F$ + 14 $4p^3(^2D)5p^3D$ + 12 $4p^3(^2P)5p^3D$
504480	505161	-681	3	74 $4p^3(^2D)5p^1F$ + 17 $4p^3(^2D)5p^3D$
504897	503622	1275	1	41 $4p^3(^2D)5p^3D$ + 37 $4p^3(^2D)5p^1P$ + 12 $4p^3(^2P)5p^3D$
506544	502353	4191	2	51 $4p^3(^2D)5p^3D$ + 29 $4p^3(^2D)5p^3F$ + 7 $4p^3(^2P)5p^1D$
507603	508524	-921	4	75 $4p^3(^2D)5p^3F$ + 16 $4s4p^44d^1G$
507868	507908	-40	3	64 $4p^3(^2D)5p^3D$ + 21 $4p^3(^2D)5p^3F$ + 10 $4p^3(^2D)5p^1F$
512175	513167	-992	2	57 $4p^3(^2D)5p^3P$ + 14 $4p^3(^2P)5p^3P$ + 10 $4p^3(^4S)5p^3P$
515789	515584	205	0	80 $4p^3(^2D)5p^3P$ + 11 $4p^3(^2P)5p^1S$
522993	523937	-944	1	37 $4p^3(^2P)5p^3D$ + 9 $4p^3(^2P)5p^1P$ + 8 $4s4p^44d^3D$

Table A.8. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
524269	524312	-43	2	53 $4p^3(^2D)5p^1D$ + 10 $4p^3(^2D)5p^3P$ + 6 $4s4p^44d^3D$
527639	528353	-714	2	44 $4p^3(^2P)5p^3D$ + 10 $4p^3(^4S)4f^3F$ + 7 $4s4p^44d^1D$
530030	530023	7	1	61 $4p^3(^2P)5p^3P$ + 19 $4p^3(^2P)5p^1P$
530591	531023	-432	0	85 $4p^3(^2P)5p^3P$ + 6 $4p^3(^4S)5p^3P$ + 5 $4p^3(^2P)5p^1S$
530672	530657	15	1	58 $4p^3(^2P)5p^3S$ + 21 $4p^3(^2D)5p^3P$ + 6 $4p^3(^2D)5p^1P$
534485	534639	-154	3	68 $4p^3(^2P)5p^3D$ + 9 $4p^3(^2D)5p^3F$ + 8 $4p^3(^2D)5p^1F$
537188	537174	14	1	22 $4s4p^44d^3D$ + 19 $4p^3(^4S)4f^5F$ + 10 $4s4p^44d^3D$
538927	537535	1392	2	63 $4p^3(^2P)5p^1D$ + 11 $4p^3(^2D)5p^1D$ + 8 $4p^3(^2D)5p^3F$
540660	542310	-1650	2	33 $4p^3(^2P)5p^3P$ + 12 $4s4p^44d^3P$ + 9 $4s4p^44d^3P$
542453	541036	1417	1	34 $4p^3(^2P)5p^1P$ + 20 $4p^3(^2P)5p^3P$ + 10 $4p^3(^2D)5p^3D$
556807	556867	-60	0	63 $4p^3(^2P)5p^1S$ + 7 $4p^3(^2D)5p^3P$ + 5 $4s4p^44d^3P$
Odd parity				
192812	192785	27	2	86 $4s4p^5^3P$ + 9 $4p^3(^2D)4d^3P$
201981	202001	-21	1	83 $4s4p^5^3P$ + 9 $4p^3(^2D)4d^3P$
208638	208552	86	0	85 $4s4p^5^3P$ + 10 $4p^3(^2D)4d^3P$
243704	243873	-169	1	64 $4s4p^5^1P$ + 27 $4p^3(^2D)4d^1P$
262683	263032	-349	0	95 $4p^3(^4S)4d^5D$
263119	263287	-168	1	96 $4p^3(^4S)4d^5D$
263702	263263	439	2	92 $4p^3(^4S)4d^5D$
264081	263321	760	3	89 $4p^3(^4S)4d^5D$
264903	264332	571	4	93 $4p^3(^4S)4d^5D$ + 5 $4p^3(^2P)4d^3F$
275418	276399	-981	2	24 $4p^3(^4S)4d^3D$ + 23 $4p^3(^2D)4d^3D$ + 23 $4p^3(^2D)4d^3F$
280850	281217	-367	3	34 $4p^3(^2D)4d^3D$ + 31 $4p^3(^4S)4d^3D$ + 12 $4p^3(^2D)4d^3F$
282419	283129	-710	1	47 $4p^3(^2D)4d^3D$ + 45 $4p^3(^4S)4d^3D$
285543	285392	151	2	48 $4p^3(^2D)4d^3F$ + 23 $4p^3(^2D)4d^3D$ + 15 $4p^3(^4S)4d^3D$
288053	287594	459	3	57 $4p^3(^2D)4d^3F$ + 14 $4p^3(^2D)4d^3D$ + 12 $4p^3(^2P)4d^3F$
289300	290371	-1071	0	93 $4p^3(^2D)4d^1S$
291472	290767	705	4	62 $4p^3(^2D)4d^3F$ + 16 $4p^3(^2D)4d^3G$ + 15 $4p^3(^2P)4d^3F$
296679	296182	497	3	81 $4p^3(^2D)4d^3G$ + 12 $4p^3(^2D)4d^3F$
298282	298336	-54	4	67 $4p^3(^2D)4d^3G$ + 28 $4p^3(^2D)4d^3F$
300720	300635	85	5	99 $4p^3(^2D)4d^3G$
303437	303512	-75	4	84 $4p^3(^2D)4d^1G$ + 7 $4p^3(^2D)4d^3G$
311985	311104	881	2	53 $4p^3(^2P)4d^1D$ + 21 $4p^3(^2D)4d^1D$ + 11 $4p^3(^2P)4d^3F$
312987	313638	-651	1	51 $4p^3(^2P)4d^3D$ + 32 $4p^3(^2D)4d^3D$ + 12 $4p^3(^4S)4d^3D$
317400	319578	-2178	0	63 $4p^3(^2P)4d^3P$ + 27 $4p^3(^2D)4d^3P$ + 6 $4p^3(^2D)4d^1S$
320989	321259	-270	2	49 $4p^3(^2P)4d^3D$ + 19 $4p^3(^2D)4d^3D$ + 12 $4p^3(^4S)4d^3D$
322407	322588	-181	3	73 $4p^3(^2P)4d^3F$ + 12 $4p^3(^2D)4d^3F$ + 8 $4p^3(^2D)4d^3G$
323711	324292	-581	2	55 $4p^3(^2P)4d^3F$ + 23 $4p^3(^2D)4d^3F$ + 6 $4p^3(^2D)4d^3D$
323870	320328	3542	1	68 $4p^3(^2P)4d^3P$ + 17 $4p^3(^2D)4d^3P$ + 6 $4p^3(^2D)4d^3S$
324907	325653	-746	4	70 $4p^3(^2P)4d^3F$ + 12 $4p^3(^2D)4d^1G$ + 8 $4p^3(^2D)4d^3G$
328276	328706	-430	3	37 $4p^3(^2P)4d^3D$ + 31 $4p^3(^2D)4d^3D$ + 11 $4p^3(^2P)4d^1F$
330126	330701	-575	2	79 $4p^3(^2P)4d^3P$ + 5 $4p^3(^2P)4d^1D$
342695	340697	1998	1	83 $4p^3(^2D)4d^3S$ + 13 $4p^3(^2D)4d^3P$
343828	344828	-1000	2	82 $4p^3(^2D)4d^3P$ + 10 $4s4p^5^3P$
345215	344686	529	1	42 $4p^3(^2D)4d^1P$ + 23 $4p^3(^2D)4d^3P$ + 20 $4s4p^5^1P$
346462	345598	864	3	51 $4p^3(^2P)4d^1F$ + 20 $4p^3(^2D)4d^1F$ + 19 $4p^3(^2P)4d^3D$
352853	353419	-566	3	42 $4p^3(^4S)4d^3D$ + 26 $4p^3(^2P)4d^3D$ + 16 $4p^3(^2D)4d^3D$
354335	354703	-368	1	35 $4p^3(^2D)4d^3P$ + 23 $4p^3(^2D)4d^1P$ + 19 $4p^3(^2P)4d^3P$
355650	355413	237	0	61 $4p^3(^2D)4d^3P$ + 24 $4p^3(^2P)4d^3P$ + 14 $4s4p^5^3P$
360177	360333	-156	2	30 $4p^3(^4S)4d^3D$ + 27 $4p^3(^2P)4d^3D$ + 16 $4p^3(^2D)4d^1D$
364897	364861	36	1	39 $4p^3(^2P)4d^3D$ + 35 $4p^3(^4S)4d^3D$ + 15 $4p^3(^2D)4d^3D$
371371	371578	-207	2	54 $4p^3(^2D)4d^1D$ + 19 $4p^3(^2P)4d^1D$ + 11 $4p^3(^2P)4d^3D$
380360	380849	-489	3	59 $4p^3(^2D)4d^1F$ + 31 $4p^3(^2P)4d^1F$
397987	397488	499	1	82 $4p^3(^2P)4d^1P$
408775	408782	-7	2	91 $4p^3(^4S)5s^5S$ + 7 $4p^3(^2P)5s^3P$
418375	418373	2	1	85 $4p^3(^4S)5s^3S$ + 6 $4p^3(^2P)5s^1P$
434766	434714	52	2	68 $4p^3(^2D)5s^3D$ + 15 $4p^3(^2P)5s^3P$ + 10 $4p^3(^2D)5s^1D$

Table A.8. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
434815	434803	12	1	79 $4p^3(^2D)5s^3D$ + 9 $4p^3(^4S)5s^3S$ + 6 $4p^3(^2P)5s^1P$
439534	439566	-32	3	99 $4p^3(^2D)5s^3D$
443204	443228	-24	2	77 $4p^3(^2D)5s^1D$ + 19 $4p^3(^2D)5s^3D$
456721	456722	-1	0	98 $4p^3(^2P)5s^3P$
458043	458073	-30	1	78 $4p^3(^2P)5s^3P$ + 18 $4p^3(^2P)5s^1P$
466123	466108	15	2	73 $4p^3(^2P)5s^3P$ + 11 $4p^3(^2D)5s^1D$ + 11 $4p^3(^2D)5s^3D$
469225	469212	13	1	67 $4p^3(^2P)5s^1P$ + 14 $4p^3(^2D)5s^3D$ + 11 $4p^3(^2P)5s^3P$

^(a) From Reader & Acquista (1976), Rahimullah et al. (1978), and Khan et al. (1983).

^(b) This work.

^(c) Only the first three components that are larger than 5% are given.

Table A.9. Calculated HFR oscillator strengths ($\log gf$) and transition probabilities (gA) in Zr iv. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			$\log gf$	gA / s^{-1}	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
445.593	0	e	1.5	224420	o	2.5	-1.61	8.24×10^{08}	0.055
447.954	1251	e	2.5	224488	o	3.5	-1.40	1.33×10^{09}	0.066
448.091	1251	e	2.5	224420	o	2.5	-2.78	5.54×10^{07}	0.043
477.788	0	e	1.5	209298	o	1.5	-2.51	9.06×10^{07}	0.381
478.965	0	e	1.5	208783	o	0.5	-1.80	4.56×10^{08}	0.404
480.661	1251	e	2.5	209298	o	1.5	-1.54	8.29×10^{08}	0.413
497.230	0	e	1.5	201114	o	2.5	-0.76	4.71×10^{09}	0.198
500.220	1251	e	2.5	201163	o	3.5	-0.59	6.87×10^{09}	0.209
500.342	1251	e	2.5	201114	o	2.5	-1.91	3.31×10^{08}	0.186
584.661	38258	e	0.5	209298	o	1.5	-1.74	3.52×10^{08}	0.572
585.428	0	e	1.5	170815	o	1.5	-1.98	2.04×10^{08}	0.561
586.424	38258	e	0.5	208783	o	0.5	-2.05	1.75×10^{08}	0.571
588.894	0	e	1.5	169810	o	0.5	-1.28	1.01×10^{09}	0.577
589.746	1251	e	2.5	170815	o	1.5	-1.02	1.83×10^{09}	0.582
628.667	0	e	1.5	159067	o	2.5	0.17	2.50×10^{10}	0.619
633.568	1251	e	2.5	159087	o	3.5	0.33	3.52×10^{10}	0.625
633.649	1251	e	2.5	159067	o	2.5	-0.98	1.75×10^{09}	0.610
700.099	81977	o	0.5	224813	e	0.5	-1.61	3.37×10^{08}	0.697
712.494	84461	o	1.5	224813	e	0.5	-1.31	6.39×10^{08}	0.694
754.394	38258	e	0.5	170815	o	1.5	-1.58	3.10×10^{08}	0.553
760.159	38258	e	0.5	169810	o	0.5	-1.88	1.51×10^{08}	0.552
846.402	81977	o	0.5	200124	e	0.5	-1.19	6.08×10^{08}	0.780
863.643	81977	o	0.5	197765	e	1.5	-1.06	7.74×10^{08}	0.516
864.586	84461	o	1.5	200124	e	0.5	-0.89	1.14×10^{09}	0.778
881.297	84461	o	1.5	197930	e	2.5	-0.81	1.32×10^{09}	0.519
882.583	84461	o	1.5	197765	e	1.5	-1.77	1.46×10^{08}	0.515
1033.769	159067	o	2.5	255800	e	3.5	-1.13	4.62×10^{08}	0.154
1033.970	159087	o	3.5	255802	e	4.5	-1.01	6.05×10^{08}	0.160
1033.984	159087	o	3.5	255800	e	3.5	-2.56	1.73×10^{07}	0.160
1099.764	159067	o	2.5	249995	e	3.5	-0.73	1.03×10^{09}	0.259
1100.007	159087	o	3.5	249995	e	4.5	-0.62	1.33×10^{09}	0.265
1100.008	159087	o	3.5	249995	e	3.5	-2.16	3.79×10^{07}	0.265
1183.973	0	e	1.5	84461	o	1.5	-0.93	5.66×10^{08}	0.852
1201.769	1251	e	2.5	84461	o	1.5	0.02	4.89×10^{09}	0.859
1212.715	159067	o	2.5	241526	e	3.5	-0.38	1.89×10^{09}	0.374
1213.009	159087	o	3.5	241527	e	4.5	-0.27	2.44×10^{09}	0.381
1213.011	159087	o	3.5	241526	e	3.5	-1.81	6.97×10^{07}	0.381
1219.862	0	e	1.5	81977	o	0.5	-0.24	2.59×10^{09}	0.857
1285.884	146652	e	1.5	224420	o	2.5	-0.27	2.15×10^{09}	0.438

Table A.9. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1290.562	147002	e	2.5	224488	o	3.5	-0.12	3.05 × 10 ⁰⁹	0.449
1291.699	147002	e	2.5	224420	o	2.5	-1.42	1.51 × 10 ⁰⁸	0.435
1417.706	81977	o	0.5	152513	e	0.5	-0.39	1.35 × 10 ⁰⁹	0.902
1440.650	159067	o	2.5	228480	e	3.5	0.06	3.71 × 10 ⁰⁹	0.526
1441.064	159087	o	3.5	228480	e	4.5	0.17	4.80 × 10 ⁰⁹	0.533
1441.069	159087	o	3.5	228480	e	3.5	-1.37	1.37 × 10 ⁰⁸	0.532
1469.472	84461	o	1.5	152513	e	0.5	-0.11	2.41 × 10 ⁰⁹	0.901
1546.171	81977	o	0.5	146652	e	1.5	0.35	6.17 × 10 ⁰⁹	0.879
1596.290	146652	e	1.5	209298	o	1.5	-1.96	2.89 × 10 ⁰⁷	0.587
1598.948	84461	o	1.5	147002	e	2.5	0.59	1.00 × 10 ¹⁰	0.879
1605.260	147002	e	2.5	209298	o	1.5	-1.00	2.56 × 10 ⁰⁸	0.590
1607.948	84461	o	1.5	146652	e	1.5	-0.37	1.10 × 10 ⁰⁹	0.878
1609.504	146652	e	1.5	208783	o	0.5	-1.26	1.41 × 10 ⁰⁸	0.588
1761.039	152513	e	0.5	209298	o	1.5	-2.21	1.33 × 10 ⁰⁷	0.536
1777.135	152513	e	0.5	208783	o	0.5	-2.51	6.50 × 10 ⁰⁶	0.536
1818.057	169810	o	0.5	224813	e	0.5	-1.07	1.73 × 10 ⁰⁸	0.822
1828.620	201114	o	2.5	255800	e	3.5	-0.73	3.69 × 10 ⁰⁸	0.171
1830.200	201163	o	3.5	255802	e	4.5	-0.61	4.85 × 10 ⁰⁸	0.179
1830.243	201163	o	3.5	255800	e	3.5	-2.16	1.39 × 10 ⁰⁷	0.179
1836.151	146652	e	1.5	201114	o	2.5	0.34	4.31 × 10 ⁰⁹	0.854
1846.375	147002	e	2.5	201163	o	3.5	0.49	6.02 × 10 ⁰⁹	0.856
1848.030	147002	e	2.5	201114	o	2.5	-0.81	3.02 × 10 ⁰⁸	0.853
1851.908	170815	o	1.5	224813	e	0.5	-0.77	3.28 × 10 ⁰⁸	0.822
2045.121	201114	o	2.5	249995	e	3.5	-0.33	7.55 × 10 ⁰⁸	0.279
2047.148	201163	o	3.5	249995	e	4.5	-0.21	9.80 × 10 ⁰⁸	0.288
2047.152	201163	o	3.5	249995	e	3.5	-1.75	2.80 × 10 ⁰⁷	0.287
2091.487	159067	o	2.5	206864	e	3.5	0.77	9.03 × 10 ⁰⁹	0.764
2092.358	159087	o	3.5	206865	e	4.5	0.89	1.17 × 10 ¹⁰	0.769
2092.370	159087	o	3.5	206864	e	3.5	-0.66	3.34 × 10 ⁰⁸	0.768
2163.682	38258	e	0.5	84461	o	1.5	0.11	1.84 × 10 ⁰⁹	0.827
2286.674	38258	e	0.5	81977	o	0.5	-0.22	7.78 × 10 ⁰⁸	0.827
2473.751	201114	o	2.5	241526	e	3.5	0.06	1.26 × 10 ⁰⁹	0.400
2476.715	201163	o	3.5	241527	e	4.5	0.18	1.64 × 10 ⁰⁹	0.410
2476.725	201163	o	3.5	241526	e	3.5	-1.37	4.68 × 10 ⁰⁷	0.409
2572.326	159067	o	2.5	197930	e	2.5	-2.03	9.40 × 10 ⁰⁶	0.290
2573.661	159087	o	3.5	197930	e	2.5	-0.72	1.90 × 10 ⁰⁸	0.300
2583.316	159067	o	2.5	197765	e	1.5	-0.89	1.30 × 10 ⁰⁸	0.290
3185.791	224420	o	2.5	255800	e	3.5	-0.51	2.06 × 10 ⁰⁸	0.167
3192.599	224488	o	3.5	255802	e	4.5	-0.38	2.72 × 10 ⁰⁸	0.177
3192.732	224488	o	3.5	255800	e	3.5	-1.93	7.78 × 10 ⁰⁶	0.177
3297.858	169810	o	0.5	200124	e	0.5	-0.22	3.72 × 10 ⁰⁸	0.927
3410.992	170815	o	1.5	200124	e	0.5	0.07	6.72 × 10 ⁰⁸	0.927
3576.107	169810	o	0.5	197765	e	1.5	0.48	1.58 × 10 ⁰⁹	0.965
3653.166	201114	o	2.5	228480	e	3.5	0.58	1.90 × 10 ⁰⁹	0.545
3659.624	201163	o	3.5	228480	e	4.5	0.70	2.47 × 10 ⁰⁹	0.556
3659.653	201163	o	3.5	228480	e	3.5	-0.85	7.05 × 10 ⁰⁷	0.555
3686.902	170815	o	1.5	197930	e	2.5	0.72	2.59 × 10 ⁰⁹	0.965
3694.764	228744	o	5.5	255802	e	4.5	-2.29	2.48 × 10 ⁰⁶	0.585
3694.764	228744	o	4.5	255802	e	4.5	-4.03	4.60 × 10 ⁰⁴	0.586
3694.941	228744	o	4.5	255800	e	3.5	-2.38	2.02 × 10 ⁰⁶	0.585
3709.521	170815	o	1.5	197765	e	1.5	-0.23	2.83 × 10 ⁰⁸	0.965
3750.603	197765	e	1.5	224420	o	2.5	0.39	1.17 × 10 ⁰⁹	0.839
3764.319	197930	e	2.5	224488	o	3.5	0.54	1.63 × 10 ⁰⁹	0.841
3774.013	197930	e	2.5	224420	o	2.5	-0.76	8.19 × 10 ⁰⁷	0.838
3908.895	224420	o	2.5	249995	e	3.5	-0.06	3.82 × 10 ⁰⁸	0.275

Table A.9. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3919.332	224488	o	3.5	249995	e	4.5	0.06	5.00×10^{08}	0.286
3919.349	224488	o	3.5	249995	e	3.5	-1.48	1.43×10^{07}	0.286
4137.442	146652	e	1.5	170815	o	1.5	-0.65	8.77×10^{07}	0.932
4198.266	147002	e	2.5	170815	o	1.5	0.30	7.56×10^{08}	0.933
4317.077	146652	e	1.5	169810	o	0.5	0.03	3.86×10^{08}	0.932
4569.218	206864	e	3.5	228744	o	4.5	1.10	4.06×10^{09}	0.971
4569.272	206865	e	4.5	228744	o	4.5	-0.54	9.22×10^{07}	0.971
4569.272	206865	e	4.5	228744	o	5.5	1.19	4.98×10^{09}	0.971
4704.218	228744	o	5.5	249995	e	4.5	-1.78	5.00×10^{06}	0.695
4704.218	228744	o	4.5	249995	e	4.5	-3.51	9.26×10^{04}	0.695
4704.243	228744	o	4.5	249995	e	3.5	-1.87	4.07×10^{06}	0.695
5462.333	152513	e	0.5	170815	o	1.5	0.32	4.66×10^{08}	0.993
5672.606	206864	e	3.5	224488	o	3.5	-1.88	2.70×10^{06}	0.600
5672.690	206865	e	4.5	224488	o	3.5	-0.34	9.46×10^{07}	0.601
5694.647	206864	e	3.5	224420	o	2.5	-0.45	7.37×10^{07}	0.596
5779.843	152513	e	0.5	169810	o	0.5	-0.01	1.97×10^{08}	0.993
5844.125	224420	o	2.5	241526	e	3.5	0.42	5.15×10^{08}	0.407
5867.466	224488	o	3.5	241527	e	4.5	0.54	6.76×10^{08}	0.421
5867.521	224488	o	3.5	241526	e	3.5	-1.00	1.93×10^{07}	0.421
6236.531	208783	o	0.5	224813	e	0.5	-0.09	1.40×10^{08}	0.937
6443.254	209298	o	1.5	224813	e	0.5	0.20	2.53×10^{08}	0.937
7820.952	228744	o	5.5	241527	e	4.5	-0.93	1.29×10^{07}	0.886
7820.952	228744	o	4.5	241527	e	4.5	-2.66	2.39×10^{05}	0.886
7821.050	228744	o	4.5	241526	e	3.5	-1.02	1.05×10^{07}	0.885
8052.979	146652	e	1.5	159067	o	2.5	0.07	1.19×10^{08}	0.839
8272.823	147002	e	2.5	159087	o	3.5	0.21	1.59×10^{08}	0.842
8286.647	147002	e	2.5	159067	o	2.5	-1.09	7.81×10^{06}	0.839
8668.720	197765	e	1.5	209298	o	1.5	-0.46	3.05×10^{07}	0.943
8794.803	197930	e	2.5	209298	o	1.5	0.49	2.63×10^{08}	0.944
9073.352	197765	e	1.5	208783	o	0.5	0.22	1.33×10^{08}	0.943
10897.421	200124	e	0.5	209298	o	1.5	0.42	1.49×10^{08}	0.995
11544.623	200124	e	0.5	208783	o	0.5	0.10	6.25×10^{07}	0.995
17385.709	201114	o	2.5	206864	e	3.5	0.31	4.54×10^{07}	0.924
17532.825	201163	o	3.5	206865	e	4.5	0.42	5.70×10^{07}	0.925
17533.624	201163	o	3.5	206864	e	3.5	-1.12	1.63×10^{06}	0.925
24630.786	224420	o	2.5	228480	e	3.5	0.65	4.93×10^{07}	0.919
25050.290	224488	o	3.5	228480	e	4.5	0.76	6.14×10^{07}	0.921
25051.670	224488	o	3.5	228480	e	3.5	-0.78	1.75×10^{06}	0.921
29859.304	197765	e	1.5	201114	o	2.5	0.06	8.50×10^{06}	0.867
30938.489	197930	e	2.5	201163	o	3.5	0.20	1.11×10^{07}	0.870
31409.897	197930	e	2.5	201114	o	2.5	-1.11	5.21×10^{05}	0.866

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from ?

Table A.10. Calculated HFR oscillator strengths (log *gf*) and transition probabilities (*gA*) in Zr v. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
165.257	0	e	0.0	605118	o	1.0	-2.26	1.34×10^{09}	0.494
168.943	0	e	0.0	591916	o	1.0	-2.05	2.07×10^{09}	0.440
170.392	0	e	0.0	586882	o	1.0	-2.30	1.14×10^{09}	0.214
171.403	0	e	0.0	583420	o	1.0	-2.85	3.21×10^{08}	0.013

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
174.284	0	e	0.0	573776	o	1.0	-6.19	1.42×10^{05}	0.000
175.016	0	e	0.0	571376	o	1.0	-2.09	1.76×10^{09}	0.187
176.044	0	e	0.0	568040	o	1.0	-2.94	2.46×10^{08}	0.163
180.989	0	e	0.0	552521	o	1.0	-1.74	3.71×10^{09}	0.353
183.042	0	e	0.0	546323	o	1.0	-1.51	6.14×10^{09}	0.229
186.146	0	e	0.0	537213	o	1.0	-1.46	6.63×10^{09}	0.389
188.027	0	e	0.0	531839	o	1.0	-1.26	1.02×10^{10}	0.250
189.242	0	e	0.0	528423	o	1.0	-2.96	2.05×10^{08}	0.269
204.795	0	e	0.0	488293	o	1.0	-1.35	7.17×10^{09}	0.388
209.874	0	e	0.0	476477	o	1.0	-0.70	3.01×10^{10}	0.290
211.339	0	e	0.0	473173	o	1.0	-0.89	1.94×10^{10}	0.569
216.306	0	e	0.0	462307	o	1.0	-0.71	2.77×10^{10}	0.408
220.310	0	e	0.0	453906	o	1.0	-2.46	4.74×10^{08}	0.413
292.188	0	e	0.0	342246	o	1.0	-0.57	2.11×10^{10}	0.406
304.006	0	e	0.0	328941	o	1.0	0.44	2.00×10^{11}	0.331
305.234	0	e	0.0	327617	o	1.0	0.48	2.18×10^{11}	0.655
368.186	0	e	0.0	271602	o	1.0	-1.34	2.25×10^{09}	0.571
372.183	241381	o	0.0	510066	e	1.0	-2.71	9.36×10^{07}	0.015
373.234	241381	o	0.0	509310	e	1.0	-3.39	1.92×10^{07}	0.012
373.549	243561	o	1.0	511263	e	2.0	-4.20	2.98×10^{06}	0.001
373.998	243561	o	1.0	510942	e	0.0	-2.65	1.07×10^{08}	0.044
375.227	243561	o	1.0	510066	e	1.0	-2.32	2.26×10^{08}	0.024
376.295	243561	o	1.0	509310	e	1.0	-3.68	9.82×10^{06}	0.004
379.794	247962	o	2.0	511263	e	2.0	-2.28	2.40×10^{08}	0.026
381.528	247962	o	2.0	510066	e	1.0	-2.90	5.82×10^{07}	0.004
382.632	247962	o	2.0	509310	e	1.0	-3.77	7.71×10^{06}	0.004
388.335	253753	o	3.0	511263	e	2.0	-1.99	4.54×10^{08}	0.027
390.780	243561	o	1.0	499459	e	0.0	-2.80	6.82×10^{07}	0.043
393.853	257361	o	2.0	511263	e	2.0	-2.86	5.87×10^{07}	0.008
395.115	241381	o	0.0	494472	e	1.0	-2.75	7.77×10^{07}	0.046
395.464	243561	o	1.0	496428	e	2.0	-2.07	3.60×10^{08}	0.133
395.719	257361	o	2.0	510066	e	1.0	-2.83	6.34×10^{07}	0.013
396.273	243561	o	1.0	495912	e	2.0	-2.45	1.49×10^{08}	0.053
396.906	257361	o	2.0	509310	e	1.0	-1.88	5.57×10^{08}	0.053
398.547	243561	o	1.0	494472	e	1.0	-3.26	2.35×10^{07}	0.011
400.425	241381	o	0.0	491116	e	1.0	-2.02	3.95×10^{08}	0.103
402.470	247962	o	2.0	496428	e	2.0	-1.56	1.14×10^{09}	0.142
403.308	247962	o	2.0	495912	e	2.0	-2.95	4.55×10^{07}	0.012
403.950	243561	o	1.0	491116	e	1.0	-1.70	8.14×10^{08}	0.096
405.190	247962	o	2.0	494760	e	3.0	-2.56	1.13×10^{08}	0.025
405.664	247962	o	2.0	494472	e	1.0	-2.44	1.47×10^{08}	0.044
407.469	265846	o	3.0	511263	e	2.0	-2.95	4.51×10^{07}	0.004
410.575	0	e	0.0	243561	o	1.0	-2.77	6.72×10^{07}	0.493
410.717	251283	o	4.0	494760	e	3.0	-0.87	5.41×10^{09}	0.249
411.263	247962	o	2.0	491116	e	1.0	-1.85	5.55×10^{08}	0.041
412.074	253753	o	3.0	496428	e	2.0	-2.53	1.16×10^{08}	0.039
412.953	253753	o	3.0	495912	e	2.0	-1.14	2.81×10^{09}	0.206
414.926	253753	o	3.0	494760	e	3.0	-1.77	6.58×10^{08}	0.194
415.451	270561	o	2.0	511263	e	2.0	-2.11	3.00×10^{08}	0.043
417.255	271602	o	1.0	511263	e	2.0	-3.07	3.26×10^{07}	0.014
417.527	270561	o	2.0	510066	e	1.0	-2.25	2.13×10^{08}	0.042
417.815	271602	o	1.0	510942	e	0.0	-1.87	5.16×10^{08}	0.179
418.293	257361	o	2.0	496428	e	2.0	-3.55	1.09×10^{07}	0.007
418.850	270561	o	2.0	509310	e	1.0	-1.36	1.64×10^{09}	0.246
419.198	257361	o	2.0	495912	e	2.0	-1.75	6.68×10^{08}	0.137

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
419.350	271602	o	1.0	510066	e	1.0	-2.47	1.29 × 10 ⁰⁸	0.032
420.683	271602	o	1.0	509310	e	1.0	-2.29	1.92 × 10 ⁰⁸	0.084
421.232	257361	o	2.0	494760	e	3.0	-3.06	3.28 × 10 ⁰⁷	0.082
421.744	257361	o	2.0	494472	e	1.0	-1.44	1.39 × 10 ⁰⁹	0.247
422.639	274655	o	2.0	511263	e	2.0	-2.14	2.67 × 10 ⁰⁸	0.033
424.788	274655	o	2.0	510066	e	1.0	-1.35	1.64 × 10 ⁰⁹	0.184
426.157	274655	o	2.0	509310	e	1.0	-2.82	5.59 × 10 ⁰⁷	0.022
427.136	277146	o	3.0	511263	e	2.0	-1.07	3.13 × 10 ⁰⁹	0.216
427.799	257361	o	2.0	491116	e	1.0	-3.41	1.42 × 10 ⁰⁷	0.029
428.774	371895	e	1.0	605118	o	1.0	-2.93	4.26 × 10 ⁰⁷	0.136
429.979	243561	o	1.0	476130	e	2.0	-1.18	2.38 × 10 ⁰⁹	0.052
433.684	265846	o	3.0	496428	e	2.0	-1.11	2.74 × 10 ⁰⁹	0.279
434.657	265846	o	3.0	495912	e	2.0	-2.03	3.22 × 10 ⁰⁸	0.050
436.844	265846	o	3.0	494760	e	3.0	-1.88	4.61 × 10 ⁰⁸	0.153
438.173	376898	e	2.0	605118	o	1.0	-1.85	4.95 × 10 ⁰⁸	0.467
438.274	247962	o	2.0	476130	e	2.0	-1.73	6.52 × 10 ⁰⁸	0.019
438.871	271602	o	1.0	499459	e	0.0	-2.04	3.15 × 10 ⁰⁸	0.162
442.738	270561	o	2.0	496428	e	2.0	-4.81	5.26 × 10 ⁰⁵	0.000
442.962	247962	o	2.0	473715	e	3.0	-0.29	1.75 × 10 ¹⁰	0.070
443.752	270561	o	2.0	495912	e	2.0	-2.08	2.75 × 10 ⁰⁸	0.051
444.788	271602	o	1.0	496428	e	2.0	-3.30	1.69 × 10 ⁰⁷	0.026
445.811	271602	o	1.0	495912	e	2.0	-2.80	5.22 × 10 ⁰⁷	0.034
445.906	380856	e	1.0	605118	o	1.0	-1.93	3.93 × 10 ⁰⁸	0.588
446.032	270561	o	2.0	494760	e	3.0	-3.52	1.02 × 10 ⁰⁷	0.025
446.606	270561	o	2.0	494472	e	1.0	-1.99	3.50 × 10 ⁰⁸	0.059
448.691	271602	o	1.0	494472	e	1.0	-2.04	3.09 × 10 ⁰⁸	0.144
448.810	247962	o	2.0	470774	e	3.0	-3.70	6.63 × 10 ⁰⁶	0.001
449.575	251283	o	4.0	473715	e	3.0	-3.10	2.64 × 10 ⁰⁷	0.000
449.687	253753	o	3.0	476130	e	2.0	-2.47	1.13 × 10 ⁰⁸	0.003
450.181	382985	e	2.0	605118	o	1.0	-2.10	2.59 × 10 ⁰⁸	0.415
450.911	274655	o	2.0	496428	e	2.0	-2.04	3.02 × 10 ⁰⁸	0.066
451.962	274655	o	2.0	495912	e	2.0	-4.61	7.89 × 10 ⁰⁵	0.000
453.401	270561	o	2.0	491116	e	1.0	-3.99	3.36 × 10 ⁰⁶	0.006
453.558	251283	o	4.0	471762	e	4.0	-1.51	9.99 × 10 ⁰⁸	0.014
453.608	243561	o	1.0	464015	e	2.0	-0.98	3.41 × 10 ⁰⁹	0.083
454.328	274655	o	2.0	494760	e	3.0	-2.72	6.20 × 10 ⁰⁷	0.045
454.502	371895	e	1.0	591916	o	1.0	-2.79	5.26 × 10 ⁰⁷	0.106
454.624	253753	o	3.0	473715	e	3.0	-1.59	8.41 × 10 ⁰⁸	0.009
454.923	274655	o	2.0	494472	e	1.0	-2.93	3.86 × 10 ⁰⁷	0.008
455.551	271602	o	1.0	491116	e	1.0	-3.00	3.21 × 10 ⁰⁷	0.037
455.601	251283	o	4.0	470774	e	3.0	-2.95	3.65 × 10 ⁰⁷	0.014
456.033	277146	o	3.0	496428	e	2.0	-4.93	3.81 × 10 ⁰⁵	0.000
456.422	241381	o	0.0	460477	e	1.0	-0.31	1.56 × 10 ¹⁰	0.249
457.103	257361	o	2.0	476130	e	2.0	-1.58	8.42 × 10 ⁰⁸	0.010
457.108	277146	o	3.0	495912	e	2.0	-2.10	2.52 × 10 ⁰⁸	0.023
458.697	253753	o	3.0	471762	e	4.0	-0.86	4.39 × 10 ⁰⁹	0.016
459.528	277146	o	3.0	494760	e	3.0	-2.68	6.61 × 10 ⁰⁷	0.027
460.547	243561	o	1.0	460694	e	2.0	-0.06	2.75 × 10 ¹⁰	0.215
460.787	253753	o	3.0	470774	e	3.0	-2.49	1.03 × 10 ⁰⁸	0.002
461.008	243561	o	1.0	460477	e	1.0	-0.36	1.38 × 10 ¹⁰	0.217
461.976	274655	o	2.0	491116	e	1.0	-2.48	1.03 × 10 ⁰⁸	0.036
462.205	257361	o	2.0	473715	e	3.0	-5.15	2.24 × 10 ⁰⁵	0.000
462.396	388853	e	0.0	605118	o	1.0	-2.57	8.32 × 10 ⁰⁷	0.317
462.849	247962	o	2.0	464015	e	2.0	-1.20	1.97 × 10 ⁰⁹	0.061
465.077	376898	e	2.0	591916	o	1.0	-1.63	7.20 × 10 ⁰⁸	0.417

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
465.145	371895	e	1.0	586882	o	1.0	-2.22	1.85 × 10 ⁰⁸	0.092
468.577	257361	o	2.0	470774	e	3.0	-0.70	6.13 × 10 ⁰⁹	0.023
469.220	391998	e	1.0	605118	o	1.0	-3.66	6.63 × 10 ⁰⁶	0.015
469.913	247962	o	2.0	460768	e	3.0	0.17	4.47 × 10 ¹⁰	0.232
470.075	247962	o	2.0	460694	e	2.0	-0.35	1.35 × 10 ¹⁰	0.190
470.556	247962	o	2.0	460477	e	1.0	-1.34	1.38 × 10 ⁰⁹	0.144
472.758	371895	e	1.0	583420	o	1.0	-2.43	1.12 × 10 ⁰⁸	0.038
473.798	380856	e	1.0	591916	o	1.0	-1.74	5.47 × 10 ⁰⁸	0.497
475.546	265846	o	3.0	476130	e	2.0	-2.09	2.40 × 10 ⁰⁸	0.011
475.597	253753	o	3.0	464015	e	2.0	-2.75	5.26 × 10 ⁰⁷	0.001
476.226	376898	e	2.0	586882	o	1.0	-3.19	1.90 × 10 ⁰⁷	0.005
477.135	247962	o	2.0	457547	e	3.0	-2.51	9.01 × 10 ⁰⁷	0.009
477.363	251283	o	4.0	460768	e	3.0	-1.09	2.37 × 10 ⁰⁹	0.025
478.187	395995	e	2.0	605118	o	1.0	-4.52	8.87 × 10 ⁰⁵	0.001
478.627	382985	e	2.0	591916	o	1.0	-1.85	4.13 × 10 ⁰⁸	0.409
478.887	396300	e	1.0	605118	o	1.0	-5.03	2.72 × 10 ⁰⁵	0.001
480.851	378753	e	3.0	586718	o	4.0	-5.34	1.31 × 10 ⁰⁵	0.031
480.881	378753	e	3.0	586705	o	4.0	-2.98	3.01 × 10 ⁰⁷	0.058
481.070	265846	o	3.0	473715	e	3.0	-2.36	1.25 × 10 ⁰⁸	0.001
482.745	251283	o	4.0	458432	e	4.0	-0.46	1.01 × 10 ¹⁰	0.175
483.059	253753	o	3.0	460768	e	3.0	-1.03	2.68 × 10 ⁰⁹	0.030
483.230	253753	o	3.0	460694	e	2.0	-1.04	2.61 × 10 ⁰⁹	0.027
483.900	257361	o	2.0	464015	e	2.0	-0.94	3.31 × 10 ⁰⁹	0.043
484.091	243561	o	1.0	450134	e	2.0	-3.52	8.63 × 10 ⁰⁶	0.005
484.209	376898	e	2.0	583420	o	1.0	-3.85	4.08 × 10 ⁰⁶	0.001
484.817	251283	o	4.0	457547	e	3.0	-1.91	3.49 × 10 ⁰⁸	0.176
485.375	380856	e	1.0	586882	o	1.0	-2.62	6.71 × 10 ⁰⁷	0.029
485.633	265846	o	3.0	471762	e	4.0	-1.15	2.01 × 10 ⁰⁹	0.010
486.454	270561	o	2.0	476130	e	2.0	-1.11	2.21 × 10 ⁰⁹	0.024
487.976	265846	o	3.0	470774	e	3.0	-3.81	4.28 × 10 ⁰⁶	0.000
488.570	253753	o	3.0	458432	e	4.0	-0.98	2.91 × 10 ⁰⁹	0.021
488.929	271602	o	1.0	476130	e	2.0	-0.36	1.23 × 10 ¹⁰	0.131
490.444	382985	e	2.0	586882	o	1.0	-3.20	1.75 × 10 ⁰⁷	0.008
490.693	253753	o	3.0	457547	e	3.0	-0.43	1.03 × 10 ¹⁰	0.193
491.627	257361	o	2.0	460768	e	3.0	-1.42	1.05 × 10 ⁰⁹	0.018
491.805	257361	o	2.0	460694	e	2.0	-0.94	3.20 × 10 ⁰⁹	0.039
491.992	251283	o	4.0	454539	e	4.0	-0.79	4.50 × 10 ⁰⁹	0.214
492.236	270561	o	2.0	473715	e	3.0	-2.35	1.23 × 10 ⁰⁸	0.001
492.330	257361	o	2.0	460477	e	1.0	-1.31	1.35 × 10 ⁰⁹	0.021
492.458	388853	e	0.0	591916	o	1.0	-2.41	1.07 × 10 ⁰⁸	0.240
493.670	380856	e	1.0	583420	o	1.0	-2.56	7.55 × 10 ⁰⁷	0.011
493.999	402688	e	0.0	605118	o	1.0	-4.07	2.32 × 10 ⁰⁶	0.007
494.077	251283	o	4.0	453681	e	5.0	0.51	8.79 × 10 ¹⁰	0.234
494.630	247962	o	2.0	450134	e	2.0	-2.32	1.31 × 10 ⁰⁸	0.020
495.342	371895	e	1.0	573776	o	1.0	-1.24	1.57 × 10 ⁰⁹	0.033
496.338	274655	o	2.0	476130	e	2.0	-1.10	2.13 × 10 ⁰⁹	0.027
498.044	253753	o	3.0	454539	e	4.0	0.32	5.60 × 10 ¹⁰	0.216
498.915	382985	e	2.0	583420	o	1.0	-2.58	7.03 × 10 ⁰⁷	0.018
499.469	270561	o	2.0	470774	e	3.0	0.23	4.57 × 10 ¹⁰	0.240
499.537	257361	o	2.0	457547	e	3.0	0.17	3.96 × 10 ¹⁰	0.193
500.206	391998	e	1.0	591916	o	1.0	-3.11	2.08 × 10 ⁰⁷	0.029
501.301	371895	e	1.0	571376	o	1.0	-1.93	3.13 × 10 ⁰⁸	0.151
502.359	274655	o	2.0	473715	e	3.0	0.24	4.57 × 10 ¹⁰	0.234
502.551	277146	o	3.0	476130	e	2.0	-2.67	5.71 × 10 ⁰⁷	0.002
502.805	371895	e	1.0	570779	o	2.0	-5.42	1.00 × 10 ⁰⁵	0.028

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
504.618	265846	o	3.0	464015	e	2.0	-2.27	1.41 × 10 ⁰⁸	0.005
504.976	388853	e	0.0	586882	o	1.0	-2.22	1.56 × 10 ⁰⁸	0.141
507.928	376898	e	2.0	573776	o	1.0	-0.90	3.28 × 10 ⁰⁹	0.053
508.725	277146	o	3.0	473715	e	3.0	-0.78	4.31 × 10 ⁰⁹	0.044
509.216	253753	o	3.0	450134	e	2.0	-2.09	2.09 × 10 ⁰⁸	0.012
509.827	371895	e	1.0	568040	o	1.0	-2.81	3.94 × 10 ⁰⁷	0.003
509.895	274655	o	2.0	470774	e	3.0	-2.73	4.78 × 10 ⁰⁷	0.001
510.410	395995	e	2.0	591916	o	1.0	-3.96	2.84 × 10 ⁰⁶	0.002
511.207	396300	e	1.0	591916	o	1.0	-4.04	2.33 × 10 ⁰⁶	0.004
513.026	265846	o	3.0	460768	e	3.0	-0.25	1.43 × 10 ¹⁰	0.122
513.127	391998	e	1.0	586882	o	1.0	-1.63	5.97 × 10 ⁰⁸	0.389
513.219	265846	o	3.0	460694	e	2.0	-1.32	1.20 × 10 ⁰⁹	0.075
513.830	277146	o	3.0	471762	e	4.0	0.40	6.35 × 10 ¹⁰	0.258
513.962	388853	e	0.0	583420	o	1.0	-1.79	4.09 × 10 ⁰⁸	0.092
514.196	376898	e	2.0	571376	o	1.0	-1.22	1.52 × 10 ⁰⁹	0.320
514.380	376898	e	2.0	571306	o	3.0	-3.62	6.00 × 10 ⁰⁶	0.015
515.649	376898	e	2.0	570828	o	3.0	-3.65	5.69 × 10 ⁰⁶	0.007
515.779	376898	e	2.0	570779	o	2.0	-4.14	1.80 × 10 ⁰⁶	0.031
516.454	277146	o	3.0	470774	e	3.0	-0.94	2.86 × 10 ⁰⁹	0.086
516.917	270561	o	2.0	464015	e	2.0	-3.98	2.58 × 10 ⁰⁶	0.000
517.241	241381	o	0.0	434715	e	1.0	-1.63	5.81 × 10 ⁰⁸	0.020
518.348	380856	e	1.0	573776	o	1.0	-4.07	2.12 × 10 ⁰⁶	0.000
518.746	257361	o	2.0	450134	e	2.0	-1.13	1.84 × 10 ⁰⁹	0.059
518.968	378753	e	3.0	571444	o	4.0	-7.94	2.85 × 10 ⁰²	0.000
519.247	265846	o	3.0	458432	e	4.0	0.37	5.83 × 10 ¹⁰	0.272
519.338	378753	e	3.0	571306	o	3.0	-4.55	6.97 × 10 ⁰⁵	0.041
519.431	378753	e	3.0	571272	o	4.0	-3.13	1.84 × 10 ⁰⁷	0.047
519.713	271602	o	1.0	464015	e	2.0	-0.15	1.75 × 10 ¹⁰	0.223
520.296	243561	o	1.0	435759	e	2.0	-1.37	1.06 × 10 ⁰⁹	0.015
520.630	378753	e	3.0	570828	o	3.0	-4.29	1.27 × 10 ⁰⁶	0.017
520.763	378753	e	3.0	570779	o	2.0	-5.59	6.27 × 10 ⁰⁴	0.019
521.645	265846	o	3.0	457547	e	3.0	-4.62	5.88 × 10 ⁰⁵	0.000
522.407	391998	e	1.0	583420	o	1.0	-2.50	7.71 × 10 ⁰⁷	0.017
523.139	243561	o	1.0	434715	e	1.0	-1.84	3.53 × 10 ⁰⁸	0.012
523.170	376898	e	2.0	568040	o	1.0	-1.69	4.94 × 10 ⁰⁸	0.042
523.870	395995	e	2.0	586882	o	1.0	-1.14	1.76 × 10 ⁰⁹	0.571
524.134	382985	e	2.0	573776	o	1.0	-1.25	1.38 × 10 ⁰⁹	0.045
524.709	396300	e	1.0	586882	o	1.0	-1.71	4.73 × 10 ⁰⁸	0.278
524.878	380856	e	1.0	571376	o	1.0	-1.34	1.12 × 10 ⁰⁹	0.389
525.744	270561	o	2.0	460768	e	3.0	-1.59	6.25 × 10 ⁰⁸	0.006
525.947	270561	o	2.0	460694	e	2.0	-1.19	1.55 × 10 ⁰⁹	0.024
526.527	380856	e	1.0	570779	o	2.0	-3.54	6.87 × 10 ⁰⁶	0.047
526.548	270561	o	2.0	460477	e	1.0	-2.77	4.08 × 10 ⁰⁷	0.001
527.104	247962	o	2.0	437678	e	3.0	-1.32	1.15 × 10 ⁰⁹	0.009
528.092	274655	o	2.0	464015	e	2.0	-4.99	2.47 × 10 ⁰⁵	0.000
528.464	402688	e	0.0	591916	o	1.0	-3.85	3.38 × 10 ⁰⁶	0.006
528.842	271602	o	1.0	460694	e	2.0	-1.26	1.30 × 10 ⁰⁹	0.013
529.450	271602	o	1.0	460477	e	1.0	-0.96	2.63 × 10 ⁰⁹	0.045
529.961	265846	o	3.0	454539	e	4.0	-0.77	4.02 × 10 ⁰⁹	0.075
530.811	382985	e	2.0	571376	o	1.0	-1.87	3.18 × 10 ⁰⁸	0.124
531.008	382985	e	2.0	571306	o	3.0	-4.56	6.46 × 10 ⁰⁵	0.004
532.359	382985	e	2.0	570828	o	3.0	-3.83	3.51 × 10 ⁰⁶	0.012
532.490	247962	o	2.0	435759	e	2.0	-1.98	2.47 × 10 ⁰⁸	0.006
532.498	382985	e	2.0	570779	o	2.0	-5.32	1.12 × 10 ⁰⁵	0.019
533.547	395995	e	2.0	583420	o	1.0	-3.71	4.61 × 10 ⁰⁶	0.001

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
534.232	380856	e	1.0	568040	o	1.0	-5.21	1.43 × 10 ⁰⁵	0.000
534.417	396300	e	1.0	583420	o	1.0	-4.97	2.52 × 10 ⁰⁵	0.000
534.800	270561	o	2.0	457547	e	3.0	-0.68	4.92 × 10 ⁰⁹	0.031
535.132	277146	o	3.0	464015	e	2.0	-1.38	9.75 × 10 ⁰⁸	0.021
535.469	247962	o	2.0	434715	e	1.0	-3.55	6.60 × 10 ⁰⁶	0.001
536.496	251283	o	4.0	437678	e	3.0	-0.78	3.89 × 10 ⁰⁹	0.033
536.918	325015	o	2.0	511263	e	2.0	-3.29	1.19 × 10 ⁰⁷	0.006
537.308	274655	o	2.0	460768	e	3.0	-0.59	5.92 × 10 ⁰⁹	0.036
537.520	274655	o	2.0	460694	e	2.0	-0.80	3.66 × 10 ⁰⁹	0.045
538.149	274655	o	2.0	460477	e	1.0	-1.72	4.44 × 10 ⁰⁸	0.032
540.380	382985	e	2.0	568040	o	1.0	-2.32	1.09 × 10 ⁰⁸	0.018
540.391	325015	o	2.0	510066	e	1.0	-1.90	2.85 × 10 ⁰⁸	0.029
540.765	388853	e	0.0	573776	o	1.0	-1.60	5.78 × 10 ⁰⁸	0.040
542.608	325015	o	2.0	509310	e	1.0	-3.06	1.99 × 10 ⁰⁷	0.019
542.628	265846	o	3.0	450134	e	2.0	-1.32	1.08 × 10 ⁰⁹	0.034
542.907	402688	e	0.0	586882	o	1.0	-2.48	7.47 × 10 ⁰⁷	0.071
543.701	253753	o	3.0	437678	e	3.0	-1.72	4.34 × 10 ⁰⁸	0.012
544.526	327617	o	1.0	511263	e	2.0	-3.51	6.98 × 10 ⁰⁶	0.001
544.597	277146	o	3.0	460768	e	3.0	-1.59	5.75 × 10 ⁰⁸	0.006
544.815	277146	o	3.0	460694	e	2.0	-3.30	1.12 × 10 ⁰⁷	0.000
545.479	327617	o	1.0	510942	e	0.0	-2.55	6.45 × 10 ⁰⁷	0.007
546.770	274655	o	2.0	457547	e	3.0	-4.05	1.98 × 10 ⁰⁶	0.000
547.876	388853	e	0.0	571376	o	1.0	-2.86	3.05 × 10 ⁰⁷	0.023
548.098	327617	o	1.0	510066	e	1.0	-2.95	2.50 × 10 ⁰⁷	0.004
548.479	328941	o	1.0	511263	e	2.0	-2.36	9.69 × 10 ⁰⁷	0.021
549.433	253753	o	3.0	435759	e	2.0	-0.97	2.40 × 10 ⁰⁹	0.029
549.447	328941	o	1.0	510942	e	0.0	-3.72	4.29 × 10 ⁰⁶	0.000
550.123	391998	e	1.0	573776	o	1.0	-1.26	1.21 × 10 ⁰⁹	0.056
550.379	327617	o	1.0	509310	e	1.0	-3.60	5.55 × 10 ⁰⁶	0.001
551.612	277146	o	3.0	458432	e	4.0	-1.47	7.51 × 10 ⁰⁸	0.004
552.104	328941	o	1.0	510066	e	1.0	-2.72	4.21 × 10 ⁰⁷	0.008
553.307	402688	e	0.0	583420	o	1.0	-2.01	2.16 × 10 ⁰⁸	0.037
553.630	371895	e	1.0	552521	o	1.0	-2.25	1.23 × 10 ⁰⁸	0.034
554.320	277146	o	3.0	457547	e	3.0	-1.62	5.19 × 10 ⁰⁸	0.019
554.418	328941	o	1.0	509310	e	1.0	-2.68	4.52 × 10 ⁰⁷	0.009
554.437	371895	e	1.0	552258	o	0.0	-2.46	7.51 × 10 ⁰⁷	0.031
554.579	257361	o	2.0	437678	e	3.0	-3.03	2.01 × 10 ⁰⁷	0.003
556.877	270561	o	2.0	450134	e	2.0	-1.00	2.15 × 10 ⁰⁹	0.035
557.483	391998	e	1.0	571376	o	1.0	-3.67	4.62 × 10 ⁰⁶	0.003
558.076	388853	e	0.0	568040	o	1.0	-2.09	1.73 × 10 ⁰⁸	0.044
559.344	391998	e	1.0	570779	o	2.0	-3.02	2.02 × 10 ⁰⁷	0.073
560.123	271602	o	1.0	450134	e	2.0	-1.23	1.27 × 10 ⁰⁹	0.106
560.545	257361	o	2.0	435759	e	2.0	-2.00	2.12 × 10 ⁰⁸	0.006
562.490	395995	e	2.0	573776	o	1.0	-2.71	4.11 × 10 ⁰⁷	0.001
563.458	396300	e	1.0	573776	o	1.0	-1.92	2.52 × 10 ⁰⁸	0.009
563.719	277146	o	3.0	454539	e	4.0	-0.74	3.82 × 10 ⁰⁹	0.029
563.846	257361	o	2.0	434715	e	1.0	-1.17	1.43 × 10 ⁰⁹	0.030
568.048	391998	e	1.0	568040	o	1.0	-1.94	2.33 × 10 ⁰⁸	0.050
568.066	376898	e	2.0	552934	o	3.0	-3.08	1.71 × 10 ⁰⁷	0.022
569.400	376898	e	2.0	552521	o	1.0	-2.75	3.69 × 10 ⁰⁷	0.006
569.868	274655	o	2.0	450134	e	2.0	-1.25	1.16 × 10 ⁰⁹	0.028
570.187	395995	e	2.0	571376	o	1.0	-3.31	1.02 × 10 ⁰⁷	0.003
570.414	395995	e	2.0	571306	o	3.0	-5.44	7.51 × 10 ⁰⁴	0.000
571.182	396300	e	1.0	571376	o	1.0	-3.08	1.72 × 10 ⁰⁷	0.009
571.974	395995	e	2.0	570828	o	3.0	-2.81	3.18 × 10 ⁰⁷	0.047

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
572.134	395995	e	2.0	570779	o	2.0	-3.92	2.44 × 10 ⁰⁶	0.059
573.135	396300	e	1.0	570779	o	2.0	-4.13	1.49 × 10 ⁰⁶	0.057
573.303	371895	e	1.0	546323	o	1.0	-3.85	2.86 × 10 ⁰⁶	0.001
574.118	378753	e	3.0	552934	o	3.0	-4.22	1.23 × 10 ⁰⁶	0.033
574.247	378753	e	3.0	552895	o	4.0	-2.80	3.25 × 10 ⁰⁷	0.040
574.301	378753	e	3.0	552878	o	4.0	-3.97	2.19 × 10 ⁰⁶	0.034
578.074	277146	o	3.0	450134	e	2.0	-1.05	1.77 × 10 ⁰⁹	0.039
581.243	395995	e	2.0	568040	o	1.0	-4.74	3.54 × 10 ⁰⁵	0.000
581.930	327617	o	1.0	499459	e	0.0	-3.58	5.20 × 10 ⁰⁶	0.001
581.962	265846	o	3.0	437678	e	3.0	-2.72	3.72 × 10 ⁰⁷	0.001
582.277	396300	e	1.0	568040	o	1.0	-2.17	1.30 × 10 ⁰⁸	0.016
582.528	380856	e	1.0	552521	o	1.0	-2.78	3.26 × 10 ⁰⁷	0.008
583.386	325015	o	2.0	496428	e	2.0	-1.75	3.48 × 10 ⁰⁸	0.167
583.421	380856	e	1.0	552258	o	0.0	-2.75	3.52 × 10 ⁰⁷	0.015
584.496	402688	e	0.0	573776	o	1.0	-1.38	8.26 × 10 ⁰⁸	0.112
585.147	325015	o	2.0	495912	e	2.0	-1.82	2.87 × 10 ⁰⁸	0.287
586.447	328941	o	1.0	499459	e	0.0	-3.04	1.74 × 10 ⁰⁷	0.002
586.843	434715	e	1.0	605118	o	1.0	-4.96	2.10 × 10 ⁰⁵	0.124
588.414	382985	e	2.0	552934	o	3.0	-4.14	1.40 × 10 ⁰⁶	0.004
588.534	265846	o	3.0	435759	e	2.0	-5.59	4.93 × 10 ⁰⁴	0.000
589.100	340315	o	0.0	510066	e	1.0	-1.50	6.05 × 10 ⁰⁸	0.173
589.119	325015	o	2.0	494760	e	3.0	-1.05	1.72 × 10 ⁰⁹	0.425
589.845	382985	e	2.0	552521	o	1.0	-2.62	4.60 × 10 ⁰⁷	0.014
590.120	325015	o	2.0	494472	e	1.0	-3.43	7.25 × 10 ⁰⁶	0.010
590.231	376898	e	2.0	546323	o	1.0	-3.21	1.18 × 10 ⁰⁷	0.004
590.462	435759	e	2.0	605118	o	1.0	-4.53	5.69 × 10 ⁰⁵	0.095
591.655	342246	o	1.0	511263	e	2.0	-1.25	1.07 × 10 ⁰⁹	0.403
591.735	340315	o	0.0	509310	e	1.0	-2.06	1.65 × 10 ⁰⁸	0.125
592.378	327617	o	1.0	496428	e	2.0	-1.77	3.25 × 10 ⁰⁸	0.141
592.781	342246	o	1.0	510942	e	0.0	-3.36	8.45 × 10 ⁰⁶	0.003
592.812	402688	e	0.0	571376	o	1.0	-3.55	5.44 × 10 ⁰⁶	0.004
594.195	327617	o	1.0	495912	e	2.0	-1.26	1.01 × 10 ⁰⁹	0.262
595.875	342246	o	1.0	510066	e	1.0	-1.70	3.72 × 10 ⁰⁸	0.095
597.060	328941	o	1.0	496428	e	2.0	-4.31	9.13 × 10 ⁰⁵	0.000
598.382	270561	o	2.0	437678	e	3.0	-3.22	1.11 × 10 ⁰⁷	0.001
598.572	342246	o	1.0	509310	e	1.0	-1.52	5.66 × 10 ⁰⁸	0.324
598.906	328941	o	1.0	495912	e	2.0	-2.86	2.52 × 10 ⁰⁷	0.007
599.323	327617	o	1.0	494472	e	1.0	-1.65	4.23 × 10 ⁰⁸	0.096
602.043	325015	o	2.0	491116	e	1.0	-1.14	1.35 × 10 ⁰⁹	0.200
604.116	328941	o	1.0	494472	e	1.0	-2.14	1.36 × 10 ⁰⁸	0.025
604.348	380856	e	1.0	546323	o	1.0	-4.02	1.76 × 10 ⁰⁶	0.000
604.772	402688	e	0.0	568040	o	1.0	-2.55	5.15 × 10 ⁰⁷	0.030
604.894	371895	e	1.0	537213	o	1.0	-2.15	1.30 × 10 ⁰⁸	0.084
605.333	270561	o	2.0	435759	e	2.0	-1.69	3.72 × 10 ⁰⁸	0.012
606.543	371895	e	1.0	536764	o	2.0	-1.02	1.73 × 10 ⁰⁹	0.342
606.844	371895	e	1.0	536682	o	2.0	-5.24	1.03 × 10 ⁰⁵	0.018
609.171	271602	o	1.0	435759	e	2.0	-2.31	8.75 × 10 ⁰⁷	0.004
609.185	270561	o	2.0	434715	e	1.0	-1.72	3.42 × 10 ⁰⁸	0.017
610.992	388853	e	0.0	552521	o	1.0	-2.38	7.47 × 10 ⁰⁷	0.039
611.624	327617	o	1.0	491116	e	1.0	-1.92	2.17 × 10 ⁰⁸	0.100
612.228	382985	e	2.0	546323	o	1.0	-2.61	4.38 × 10 ⁰⁷	0.027
613.072	271602	o	1.0	434715	e	1.0	-2.37	7.61 × 10 ⁰⁷	0.002
613.408	274655	o	2.0	437678	e	3.0	-1.61	4.37 × 10 ⁰⁸	0.013
616.617	328941	o	1.0	491116	e	1.0	-2.32	8.40 × 10 ⁰⁷	0.051
620.715	274655	o	2.0	435759	e	2.0	-3.03	1.61 × 10 ⁰⁷	0.000

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
622.504	376898	e	2.0	537539	o	3.0	-3.23	1.02×10^{07}	0.017
622.926	277146	o	3.0	437678	e	3.0	-1.66	3.73×10^{08}	0.010
622.965	391998	e	1.0	552521	o	1.0	-1.19	1.10×10^{09}	0.446
623.769	376898	e	2.0	537213	o	1.0	-0.97	1.86×10^{09}	0.455
623.987	391998	e	1.0	552258	o	0.0	-1.33	8.02×10^{08}	0.441
624.766	274655	o	2.0	434715	e	1.0	-3.54	4.95×10^{06}	0.001
625.219	371895	e	1.0	531839	o	1.0	-4.13	1.26×10^{06}	0.001
625.523	376898	e	2.0	536764	o	2.0	-1.22	1.04×10^{09}	0.547
625.650	376898	e	2.0	536732	o	3.0	-3.56	4.72×10^{06}	0.004
625.843	376898	e	2.0	536682	o	2.0	-3.87	2.30×10^{06}	0.025
628.426	243561	o	1.0	402688	e	0.0	-2.19	1.09×10^{08}	0.098
629.779	378753	e	3.0	537539	o	3.0	-4.21	1.05×10^{06}	0.034
629.927	378753	e	3.0	537502	o	4.0	-2.81	2.63×10^{07}	0.041
630.463	277146	o	3.0	435759	e	2.0	-2.03	1.57×10^{08}	0.007
632.013	371895	e	1.0	530120	o	2.0	-3.67	3.57×10^{06}	0.006
632.869	378753	e	3.0	536764	o	2.0	-0.61	4.09×10^{09}	0.566
632.999	378753	e	3.0	536732	o	3.0	-3.92	2.00×10^{06}	0.017
633.197	378753	e	3.0	536682	o	2.0	-5.20	1.05×10^{05}	0.022
635.041	388853	e	0.0	546323	o	1.0	-2.35	7.32×10^{07}	0.016
635.372	371895	e	1.0	529283	o	2.0	-1.40	6.62×10^{08}	0.075
636.078	342246	o	1.0	499459	e	0.0	-2.91	2.00×10^{07}	0.011
636.127	434715	e	1.0	591916	o	1.0	-4.34	7.55×10^{05}	0.169
637.192	395995	e	2.0	552934	o	3.0	-4.58	4.33×10^{05}	0.001
638.865	371895	e	1.0	528423	o	1.0	-1.42	6.25×10^{08}	0.089
638.871	395995	e	2.0	552521	o	1.0	-0.79	2.67×10^{09}	0.554
639.558	380856	e	1.0	537213	o	1.0	-1.00	1.63×10^{09}	0.623
640.120	396300	e	1.0	552521	o	1.0	-1.39	6.69×10^{08}	0.243
640.382	435759	e	2.0	591916	o	1.0	-3.96	1.79×10^{06}	0.118
641.199	396300	e	1.0	552258	o	0.0	-1.30	8.20×10^{08}	0.407
641.402	380856	e	1.0	536764	o	2.0	-2.24	9.24×10^{07}	0.097
641.739	380856	e	1.0	536682	o	2.0	-3.26	8.95×10^{06}	0.037
645.227	450134	e	2.0	605118	o	1.0	-4.86	2.20×10^{05}	0.030
645.406	376898	e	2.0	531839	o	1.0	-2.03	1.50×10^{08}	0.096
645.498	241381	o	0.0	396300	e	1.0	-2.15	1.14×10^{08}	0.027
647.023	382985	e	2.0	537539	o	3.0	-4.16	1.10×10^{06}	0.004
647.985	391998	e	1.0	546323	o	1.0	-1.73	2.97×10^{08}	0.100
648.389	382985	e	2.0	537213	o	1.0	-1.24	9.21×10^{08}	0.419
648.583	342246	o	1.0	496428	e	2.0	-2.33	7.48×10^{07}	0.065
648.691	340315	o	0.0	494472	e	1.0	-3.33	7.63×10^{06}	0.010
650.285	382985	e	2.0	536764	o	2.0	-1.03	1.48×10^{09}	0.561
650.422	382985	e	2.0	536732	o	3.0	-3.42	6.02×10^{06}	0.014
650.630	382985	e	2.0	536682	o	2.0	-4.98	1.66×10^{05}	0.018
650.761	342246	o	1.0	495912	e	2.0	-3.59	3.95×10^{06}	0.002
651.178	376898	e	2.0	530466	o	3.0	-3.20	9.87×10^{06}	0.002
652.648	376898	e	2.0	530120	o	2.0	-1.46	5.41×10^{08}	0.222
654.709	243561	o	1.0	396300	e	1.0	-2.34	7.14×10^{07}	0.011
656.021	243561	o	1.0	395995	e	2.0	-3.02	1.49×10^{07}	0.004
656.160	376898	e	2.0	529300	o	3.0	-1.03	1.44×10^{09}	0.188
656.230	376898	e	2.0	529283	o	2.0	-2.13	1.15×10^{08}	0.040
656.916	342246	o	1.0	494472	e	1.0	-3.73	2.92×10^{06}	0.002
657.171	434715	e	1.0	586882	o	1.0	-3.54	4.40×10^{06}	0.179
659.143	378753	e	3.0	530466	o	3.0	-1.34	6.95×10^{08}	0.298
659.957	376898	e	2.0	528423	o	1.0	-3.52	4.63×10^{06}	0.003
660.649	378753	e	3.0	530120	o	2.0	-2.61	3.74×10^{07}	0.153
661.713	435759	e	2.0	586882	o	1.0	-3.01	1.48×10^{07}	0.210

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
661.746	325015	o	2.0	476130	e	2.0	-4.36	6.63×10^{05}	0.015
662.324	380856	e	1.0	531839	o	1.0	-1.44	5.56×10^{08}	0.157
663.128	340315	o	0.0	491116	e	1.0	-2.06	1.32×10^{08}	0.088
663.935	241381	o	0.0	391998	e	1.0	-2.85	2.15×10^{07}	0.025
664.248	378753	e	3.0	529300	o	3.0	-1.85	2.13×10^{08}	0.202
664.320	378753	e	3.0	529283	o	2.0	-3.21	9.43×10^{06}	0.004
664.857	378753	e	3.0	529162	o	4.0	-0.86	2.09×10^{09}	0.175
665.212	395995	e	2.0	546323	o	1.0	-2.17	1.02×10^{08}	0.050
666.566	396300	e	1.0	546323	o	1.0	-1.78	2.46×10^{08}	0.073
667.411	402688	e	0.0	552521	o	1.0	-1.59	3.85×10^{08}	0.201
669.953	380856	e	1.0	530120	o	2.0	-1.28	7.79×10^{08}	0.198
670.960	437678	e	3.0	586718	o	4.0	-3.28	7.70×10^{06}	0.009
671.020	437678	e	3.0	586705	o	4.0	-0.94	1.71×10^{09}	0.040
671.725	342246	o	1.0	491116	e	1.0	-2.03	1.40×10^{08}	0.073
671.800	382985	e	2.0	531839	o	1.0	-3.01	1.43×10^{07}	0.015
672.471	434715	e	1.0	583420	o	1.0	-2.74	2.72×10^{07}	0.015
672.493	325015	o	2.0	473715	e	3.0	-3.03	1.39×10^{07}	0.020
673.341	327617	o	1.0	476130	e	2.0	-0.81	2.30×10^{09}	0.117
673.684	243561	o	1.0	391998	e	1.0	-1.98	1.52×10^{08}	0.113
673.728	380856	e	1.0	529283	o	2.0	-2.37	6.32×10^{07}	0.019
674.034	388853	e	0.0	537213	o	1.0	-1.60	3.67×10^{08}	0.265
674.136	247962	o	2.0	396300	e	1.0	-1.16	1.02×10^{09}	0.079
675.527	247962	o	2.0	395995	e	2.0	-1.18	9.58×10^{08}	0.130
677.227	435759	e	2.0	583420	o	1.0	-4.79	2.37×10^{05}	0.000
677.657	380856	e	1.0	528423	o	1.0	-3.12	1.11×10^{07}	0.005
678.056	382985	e	2.0	530466	o	3.0	-1.05	1.28×10^{09}	0.282
679.397	328941	o	1.0	476130	e	2.0	-0.21	8.83×10^{09}	0.203
679.650	382985	e	2.0	530120	o	2.0	-6.44	5.26×10^{03}	0.000
683.459	382985	e	2.0	529300	o	3.0	-2.71	2.78×10^{07}	0.013
683.535	382985	e	2.0	529283	o	2.0	-1.60	3.59×10^{08}	0.097
686.066	325015	o	2.0	470774	e	3.0	-7.09	1.15×10^{03}	0.001
687.580	382985	e	2.0	528423	o	1.0	-2.55	4.01×10^{07}	0.030
688.268	243561	o	1.0	388853	e	0.0	-1.53	4.15×10^{08}	0.159
688.634	391998	e	1.0	537213	o	1.0	-2.44	5.07×10^{07}	0.031
690.772	391998	e	1.0	536764	o	2.0	-4.71	2.70×10^{05}	0.001
691.162	391998	e	1.0	536682	o	2.0	-2.62	3.34×10^{07}	0.070
691.366	460477	e	1.0	605118	o	1.0	-5.90	1.74×10^{04}	0.012
692.406	460694	e	2.0	605118	o	1.0	-5.57	3.78×10^{04}	0.010
694.270	247962	o	2.0	391998	e	1.0	-2.56	3.79×10^{07}	0.024
696.211	402688	e	0.0	546323	o	1.0	-1.82	2.07×10^{08}	0.037
699.369	388853	e	0.0	531839	o	1.0	-1.77	2.30×10^{08}	0.064
703.029	253753	o	3.0	395995	e	2.0	-1.02	1.30×10^{09}	0.062
705.307	450134	e	2.0	591916	o	1.0	-3.87	1.83×10^{06}	0.085
706.493	395995	e	2.0	537539	o	3.0	-4.70	2.67×10^{05}	0.001
708.123	395995	e	2.0	537213	o	1.0	-5.40	5.27×10^{04}	0.000
708.704	464015	e	2.0	605118	o	1.0	-5.13	9.82×10^{04}	0.007
709.657	396300	e	1.0	537213	o	1.0	-2.99	1.34×10^{07}	0.009
710.384	395995	e	2.0	536764	o	2.0	-2.78	2.20×10^{07}	0.011
710.548	395995	e	2.0	536732	o	3.0	-2.32	6.34×10^{07}	0.060
710.797	395995	e	2.0	536682	o	2.0	-3.48	4.40×10^{06}	0.063
711.928	396300	e	1.0	536764	o	2.0	-2.34	6.07×10^{07}	0.032
712.343	396300	e	1.0	536682	o	2.0	-3.70	2.61×10^{06}	0.059
715.100	391998	e	1.0	531839	o	1.0	-2.62	3.09×10^{07}	0.014
716.487	388853	e	0.0	528423	o	1.0	-3.49	4.18×10^{06}	0.003
716.978	241381	o	0.0	380856	e	1.0	-1.81	2.00×10^{08}	0.132

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
717.235	243561	o	1.0	382985	e	2.0	-1.09	1.05×10^{09}	0.461
719.107	434715	e	1.0	573776	o	1.0	-1.01	1.26×10^{09}	0.276
719.422	325015	o	2.0	464015	e	2.0	-4.37	5.52×10^{05}	0.009
719.740	257361	o	2.0	396300	e	1.0	-2.20	8.16×10^{07}	0.015
721.325	257361	o	2.0	395995	e	2.0	-1.79	2.08×10^{08}	0.039
724.001	391998	e	1.0	530120	o	2.0	-2.55	3.59×10^{07}	0.012
724.549	435759	e	2.0	573776	o	1.0	-0.50	4.05×10^{09}	0.300
728.360	243561	o	1.0	380856	e	1.0	-4.31	6.22×10^{05}	0.000
728.412	391998	e	1.0	529283	o	2.0	-5.28	6.68×10^{04}	0.000
731.271	450134	e	2.0	586882	o	1.0	-4.69	2.51×10^{05}	0.009
731.736	434715	e	1.0	571376	o	1.0	-3.24	7.16×10^{06}	0.093
733.007	391998	e	1.0	528423	o	1.0	-2.80	1.99×10^{07}	0.018
733.146	327617	o	1.0	464015	e	2.0	-1.22	7.43×10^{08}	0.044
734.944	434715	e	1.0	570779	o	2.0	-0.70	2.45×10^{09}	0.100
736.138	395995	e	2.0	531839	o	1.0	-3.38	5.09×10^{06}	0.004
736.634	325015	o	2.0	460768	e	3.0	-3.04	1.14×10^{07}	0.024
737.032	325015	o	2.0	460694	e	2.0	-3.75	2.20×10^{06}	0.015
737.371	435759	e	2.0	571376	o	1.0	-2.82	1.86×10^{07}	0.076
737.750	435759	e	2.0	571306	o	3.0	-1.41	4.83×10^{08}	0.061
737.797	396300	e	1.0	531839	o	1.0	-3.13	8.99×10^{06}	0.005
738.214	325015	o	2.0	460477	e	1.0	-4.86	1.68×10^{05}	0.010
740.331	328941	o	1.0	464015	e	2.0	-0.59	3.13×10^{09}	0.087
740.362	435759	e	2.0	570828	o	3.0	-0.69	2.49×10^{09}	0.100
740.616	247962	o	2.0	382985	e	2.0	-0.56	3.33×10^{09}	0.449
740.630	435759	e	2.0	570779	o	2.0	-1.40	4.86×10^{08}	0.101
742.737	257361	o	2.0	391998	e	1.0	-0.93	1.42×10^{09}	0.097
743.356	402688	e	0.0	537213	o	1.0	-2.16	8.33×10^{07}	0.044
743.657	395995	e	2.0	530466	o	3.0	-2.81	1.85×10^{07}	0.005
745.575	395995	e	2.0	530120	o	2.0	-3.73	2.22×10^{06}	0.001
746.912	342246	o	1.0	476130	e	2.0	-2.03	1.13×10^{08}	0.189
747.276	396300	e	1.0	530120	o	2.0	-4.70	2.36×10^{05}	0.000
747.577	437678	e	3.0	571444	o	4.0	-5.82	1.82×10^{04}	0.000
748.345	437678	e	3.0	571306	o	3.0	-2.22	7.19×10^{07}	0.066
748.539	437678	e	3.0	571272	o	4.0	-0.63	2.82×10^{09}	0.105
749.980	243561	o	1.0	376898	e	2.0	-1.33	5.47×10^{08}	0.391
750.045	434715	e	1.0	568040	o	1.0	-1.38	4.85×10^{08}	0.120
750.162	395995	e	2.0	529300	o	3.0	-3.23	7.08×10^{06}	0.002
750.253	395995	e	2.0	529283	o	2.0	-2.77	2.02×10^{07}	0.007
750.265	450134	e	2.0	583420	o	1.0	-1.95	1.34×10^{08}	0.034
751.032	437678	e	3.0	570828	o	3.0	-1.52	3.60×10^{08}	0.104
751.308	437678	e	3.0	570779	o	2.0	-2.86	1.63×10^{07}	0.102
751.444	327617	o	1.0	460694	e	2.0	-3.26	6.49×10^{06}	0.008
751.576	453681	e	5.0	586735	o	5.0	-3.46	4.13×10^{06}	0.001
751.668	453681	e	5.0	586718	o	4.0	-4.54	3.40×10^{05}	0.003
751.743	453681	e	5.0	586705	o	4.0	-2.73	2.18×10^{07}	0.036
751.976	396300	e	1.0	529283	o	2.0	-2.37	5.02×10^{07}	0.011
752.484	247962	o	2.0	380856	e	1.0	-1.22	7.13×10^{08}	0.171
752.672	327617	o	1.0	460477	e	1.0	-3.41	4.55×10^{06}	0.020
755.128	395995	e	2.0	528423	o	1.0	-5.96	1.30×10^{04}	0.000
755.967	435759	e	2.0	568040	o	1.0	-0.97	1.24×10^{09}	0.121
756.454	454539	e	4.0	586735	o	5.0	-1.85	1.64×10^{08}	0.003
756.548	454539	e	4.0	586718	o	4.0	-6.16	8.12×10^{03}	0.000
756.624	454539	e	4.0	586705	o	4.0	-3.33	5.45×10^{06}	0.002
756.874	396300	e	1.0	528423	o	1.0	-4.85	1.67×10^{05}	0.000
758.994	328941	o	1.0	460694	e	2.0	-6.20	7.34×10^{03}	0.000

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
760.247	328941	o	1.0	460477	e	1.0	-4.05	1.02 × 10 ⁰⁶	0.003
760.809	460477	e	1.0	591916	o	1.0	-5.15	8.13 × 10 ⁰⁴	0.032
762.068	460694	e	2.0	591916	o	1.0	-4.76	2.00 × 10 ⁰⁵	0.027
762.853	271602	o	1.0	402688	e	0.0	-1.45	4.08 × 10 ⁰⁸	0.243
764.578	247962	o	2.0	378753	e	3.0	-1.19	7.28 × 10 ⁰⁸	0.376
766.202	241381	o	0.0	371895	e	1.0	-0.82	1.73 × 10 ⁰⁹	0.560
768.347	265846	o	3.0	395995	e	2.0	-1.83	1.66 × 10 ⁰⁸	0.012
773.804	253753	o	3.0	382985	e	2.0	-1.63	2.65 × 10 ⁰⁸	0.060
774.165	457547	e	3.0	586718	o	4.0	-1.34	5.06 × 10 ⁰⁸	0.014
774.244	457547	e	3.0	586705	o	4.0	-7.67	2.40 × 10 ⁰²	0.000
774.290	402688	e	0.0	531839	o	1.0	-2.76	1.95 × 10 ⁰⁷	0.004
775.267	476130	e	2.0	605118	o	1.0	-4.13	8.27 × 10 ⁰⁵	0.058
775.582	247962	o	2.0	376898	e	2.0	-1.86	1.53 × 10 ⁰⁸	0.059
779.215	243561	o	1.0	371895	e	1.0	-0.45	3.86 × 10 ⁰⁹	0.556
779.409	458432	e	4.0	586735	o	5.0	-1.64	2.51 × 10 ⁰⁸	0.007
779.508	458432	e	4.0	586718	o	4.0	-3.32	5.27 × 10 ⁰⁶	0.003
779.589	458432	e	4.0	586705	o	4.0	-2.46	3.84 × 10 ⁰⁷	0.008
781.857	464015	e	2.0	591916	o	1.0	-5.06	9.54 × 10 ⁰⁴	0.003
784.498	251283	o	4.0	378753	e	3.0	0.20	1.71 × 10 ¹⁰	0.644
791.107	460477	e	1.0	586882	o	1.0	-4.86	1.47 × 10 ⁰⁵	0.012
792.469	460694	e	2.0	586882	o	1.0	-4.31	5.24 × 10 ⁰⁵	0.017
793.961	460768	e	3.0	586718	o	4.0	-4.30	5.30 × 10 ⁰⁵	0.000
794.045	460768	e	3.0	586705	o	4.0	-1.75	1.89 × 10 ⁰⁸	0.008
795.295	270561	o	2.0	396300	e	1.0	-1.64	2.42 × 10 ⁰⁸	0.037
795.327	402688	e	0.0	528423	o	1.0	-3.04	9.65 × 10 ⁰⁶	0.018
796.028	257361	o	2.0	382985	e	2.0	-2.41	4.14 × 10 ⁰⁷	0.027
797.231	270561	o	2.0	395995	e	2.0	-1.08	8.67 × 10 ⁰⁸	0.154
799.240	325015	o	2.0	450134	e	2.0	-5.69	2.11 × 10 ⁰⁴	0.012
800.000	253753	o	3.0	378753	e	3.0	-0.68	2.19 × 10 ⁰⁹	0.614
801.933	271602	o	1.0	396300	e	1.0	-1.24	5.93 × 10 ⁰⁸	0.166
803.901	271602	o	1.0	395995	e	2.0	-2.52	3.12 × 10 ⁰⁷	0.032
806.889	247962	o	2.0	371895	e	1.0	-0.47	3.47 × 10 ⁰⁹	0.324
808.785	450134	e	2.0	573776	o	1.0	-1.82	1.53 × 10 ⁰⁸	0.084
809.754	257361	o	2.0	380856	e	1.0	-0.31	4.98 × 10 ⁰⁹	0.563
812.056	253753	o	3.0	376898	e	2.0	-0.06	8.94 × 10 ⁰⁹	0.573
813.384	460477	e	1.0	583420	o	1.0	-2.90	1.29 × 10 ⁰⁷	0.125
813.891	464015	e	2.0	586882	o	1.0	-4.68	2.09 × 10 ⁰⁵	0.003
814.824	460694	e	2.0	583420	o	1.0	-3.00	1.03 × 10 ⁰⁷	0.022
816.215	327617	o	1.0	450134	e	2.0	-1.13	7.48 × 10 ⁰⁸	0.045
821.222	342246	o	1.0	464015	e	2.0	-1.96	1.09 × 10 ⁰⁸	0.176
822.059	274655	o	2.0	396300	e	1.0	-0.18	6.50 × 10 ⁰⁹	0.678
823.468	270561	o	2.0	391998	e	1.0	-0.21	6.05 × 10 ⁰⁹	0.662
823.777	257361	o	2.0	378753	e	3.0	-1.99	1.02 × 10 ⁰⁸	0.393
824.128	274655	o	2.0	395995	e	2.0	-1.16	6.74 × 10 ⁰⁸	0.103
824.795	450134	e	2.0	571376	o	1.0	-2.72	1.89 × 10 ⁰⁷	0.276
825.131	328941	o	1.0	450134	e	2.0	-0.73	1.85 × 10 ⁰⁹	0.046
825.269	450134	e	2.0	571306	o	3.0	-0.91	1.20 × 10 ⁰⁹	0.174
828.538	450134	e	2.0	570828	o	3.0	-1.27	5.21 × 10 ⁰⁸	0.101
828.874	450134	e	2.0	570779	o	2.0	-2.70	1.93 × 10 ⁰⁷	0.157
830.587	271602	o	1.0	391998	e	1.0	-1.49	3.11 × 10 ⁰⁸	0.145
832.214	340315	o	0.0	460477	e	1.0	-3.37	4.10 × 10 ⁰⁶	0.023
836.565	257361	o	2.0	376898	e	2.0	-0.67	2.05 × 10 ⁰⁹	0.561
837.489	464015	e	2.0	583420	o	1.0	-2.73	1.82 × 10 ⁰⁷	0.008
841.400	277146	o	3.0	395995	e	2.0	0.04	1.04 × 10 ¹⁰	0.655
844.249	342246	o	1.0	460694	e	2.0	-3.50	2.96 × 10 ⁰⁶	0.018

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
845.800	342246	o	1.0	460477	e	1.0	-3.81	1.45×10^{06}	0.020
848.131	450134	e	2.0	568040	o	1.0	-2.93	1.07×10^{07}	0.024
848.850	434715	e	1.0	552521	o	1.0	-3.41	3.63×10^{06}	0.102
849.103	453681	e	5.0	571452	o	5.0	-0.85	1.32×10^{09}	0.310
849.165	453681	e	5.0	571444	o	4.0	-2.57	2.49×10^{07}	0.305
850.406	453681	e	5.0	571272	o	4.0	-3.00	9.15×10^{06}	0.021
850.748	434715	e	1.0	552258	o	0.0	-3.05	8.25×10^{06}	0.156
852.197	274655	o	2.0	391998	e	1.0	-2.34	4.22×10^{07}	0.012
852.611	453681	e	5.0	570968	o	5.0	-1.50	2.89×10^{08}	0.312
852.764	453681	e	5.0	570947	o	6.0	0.27	1.69×10^{10}	0.314
852.869	271602	o	1.0	388853	e	0.0	-0.66	2.01×10^{09}	0.694
853.429	435759	e	2.0	552934	o	3.0	-1.07	7.80×10^{08}	0.047
853.682	265846	o	3.0	382985	e	2.0	-0.03	8.53×10^{09}	0.644
855.334	454539	e	4.0	571452	o	5.0	-1.45	3.28×10^{08}	0.018
855.397	454539	e	4.0	571444	o	4.0	-0.86	1.27×10^{09}	0.331
856.403	454539	e	4.0	571306	o	3.0	-2.70	1.81×10^{07}	0.043
856.443	435759	e	2.0	552521	o	1.0	-2.93	1.08×10^{07}	0.109
856.657	454539	e	4.0	571272	o	4.0	-2.09	7.36×10^{07}	0.034
858.894	454539	e	4.0	570968	o	5.0	0.16	1.32×10^{10}	0.342
859.125	371895	e	1.0	488293	o	1.0	-1.72	1.71×10^{08}	0.037
859.924	454539	e	4.0	570828	o	3.0	-4.11	7.03×10^{05}	0.002
862.480	470774	e	3.0	586718	o	4.0	0.08	1.09×10^{10}	0.365
862.579	470774	e	3.0	586705	o	4.0	-2.51	2.78×10^{07}	0.004
863.174	371895	e	1.0	487747	o	0.0	-1.96	9.80×10^{07}	0.030
863.664	476130	e	2.0	591916	o	1.0	-3.83	1.32×10^{06}	0.047
867.638	437678	e	3.0	552934	o	3.0	-1.91	1.10×10^{08}	0.049
867.932	437678	e	3.0	552895	o	4.0	-0.50	2.79×10^{09}	0.073
868.055	437678	e	3.0	552878	o	4.0	-1.68	1.87×10^{08}	0.043
869.776	471762	e	4.0	586735	o	5.0	0.19	1.37×10^{10}	0.406
869.900	471762	e	4.0	586718	o	4.0	-1.52	2.69×10^{08}	0.113
870.000	471762	e	4.0	586705	o	4.0	-1.35	3.96×10^{08}	0.111
873.104	257361	o	2.0	371895	e	1.0	-2.15	6.26×10^{07}	0.135
877.178	491116	e	1.0	605118	o	1.0	-2.54	2.48×10^{07}	0.201
877.987	457547	e	3.0	571444	o	4.0	0.05	9.78×10^{09}	0.384
879.047	457547	e	3.0	571306	o	3.0	-0.88	1.15×10^{09}	0.352
879.314	457547	e	3.0	571272	o	4.0	-2.29	4.46×10^{07}	0.006
882.620	460477	e	1.0	573776	o	1.0	-1.29	4.37×10^{08}	0.464
882.757	457547	e	3.0	570828	o	3.0	-3.31	4.21×10^{06}	0.003
883.138	457547	e	3.0	570779	o	2.0	-2.98	8.95×10^{06}	0.033
884.315	460694	e	2.0	573776	o	1.0	-0.97	9.22×10^{08}	0.393
884.799	458432	e	4.0	571452	o	5.0	0.15	1.21×10^{10}	0.446
884.866	458432	e	4.0	571444	o	4.0	-2.01	8.26×10^{07}	0.040
884.934	473715	e	3.0	586718	o	4.0	-2.15	5.95×10^{07}	0.019
885.038	473715	e	3.0	586705	o	4.0	0.03	9.19×10^{09}	0.463
885.678	265846	o	3.0	378753	e	3.0	-0.80	1.33×10^{09}	0.532
885.943	458432	e	4.0	571306	o	3.0	-2.51	2.60×10^{07}	0.096
886.214	458432	e	4.0	571272	o	4.0	-0.79	1.39×10^{09}	0.378
887.601	325015	o	2.0	437678	e	3.0	-3.36	3.68×10^{06}	0.010
888.609	458432	e	4.0	570968	o	5.0	-1.16	5.87×10^{08}	0.043
889.488	270561	o	2.0	382985	e	2.0	-4.62	2.02×10^{05}	0.000
889.711	458432	e	4.0	570828	o	3.0	-2.66	1.86×10^{07}	0.053
895.990	434715	e	1.0	546323	o	1.0	-3.69	1.70×10^{06}	0.001
897.706	376898	e	2.0	488293	o	1.0	-2.61	2.02×10^{07}	0.002
897.799	271602	o	1.0	382985	e	2.0	-2.39	3.39×10^{07}	0.092
900.478	265846	o	3.0	376898	e	2.0	-1.02	7.77×10^{08}	0.131

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
901.721	460477	e	1.0	571376	o	1.0	-3.16	5.67 × 10 ⁰⁶	0.337
902.920	476130	e	2.0	586882	o	1.0	-4.05	7.27 × 10 ⁰⁵	0.011
902.982	325015	o	2.0	435759	e	2.0	-4.13	6.11 × 10 ⁰⁵	0.007
903.490	460694	e	2.0	571376	o	1.0	-2.74	1.49 × 10 ⁰⁷	0.331
903.537	460768	e	3.0	571444	o	4.0	-5.79	1.33 × 10 ⁰⁴	0.000
903.783	494472	e	1.0	605118	o	1.0	-1.66	1.74 × 10 ⁰⁸	0.672
904.059	460694	e	2.0	571306	o	3.0	-0.48	2.69 × 10 ⁰⁹	0.439
904.454	435759	e	2.0	546323	o	1.0	-2.23	4.76 × 10 ⁰⁷	0.023
904.660	460768	e	3.0	571306	o	3.0	-1.65	1.81 × 10 ⁰⁸	0.112
904.943	460768	e	3.0	571272	o	4.0	-0.06	7.08 × 10 ⁰⁹	0.441
906.599	460477	e	1.0	570779	o	2.0	-0.49	2.63 × 10 ⁰⁹	0.514
906.662	270561	o	2.0	380856	e	1.0	-1.14	5.88 × 10 ⁰⁸	0.079
907.984	460694	e	2.0	570828	o	3.0	-0.68	1.68 × 10 ⁰⁹	0.343
908.387	460694	e	2.0	570779	o	2.0	-1.00	8.01 × 10 ⁰⁸	0.422
908.590	460768	e	3.0	570828	o	3.0	-0.99	8.21 × 10 ⁰⁸	0.380
908.993	460768	e	3.0	570779	o	2.0	-2.34	3.66 × 10 ⁰⁷	0.337
911.074	464015	e	2.0	573776	o	1.0	-1.25	4.51 × 10 ⁰⁸	0.295
911.579	325015	o	2.0	434715	e	1.0	-5.25	4.49 × 10 ⁰⁴	0.006
915.299	271602	o	1.0	380856	e	1.0	-0.85	1.13 × 10 ⁰⁹	0.541
915.701	495912	e	2.0	605118	o	1.0	-1.55	2.31 × 10 ⁰⁸	0.523
920.048	496428	e	2.0	605118	o	1.0	-1.92	9.41 × 10 ⁰⁷	0.402
923.101	274655	o	2.0	382985	e	2.0	-0.96	8.50 × 10 ⁰⁸	0.216
924.278	270561	o	2.0	378753	e	3.0	-2.45	2.77 × 10 ⁰⁷	0.139
924.709	327617	o	1.0	435759	e	2.0	-2.83	1.17 × 10 ⁰⁷	0.019
926.887	342246	o	1.0	450134	e	2.0	-3.40	3.11 × 10 ⁰⁶	0.015
929.687	460477	e	1.0	568040	o	1.0	-1.77	1.29 × 10 ⁰⁸	0.418
930.777	380856	e	1.0	488293	o	1.0	-2.29	3.93 × 10 ⁰⁷	0.006
931.440	464015	e	2.0	571376	o	1.0	-3.15	5.52 × 10 ⁰⁶	0.057
931.568	460694	e	2.0	568040	o	1.0	-1.50	2.40 × 10 ⁰⁸	0.283
932.045	464015	e	2.0	571306	o	3.0	-0.46	2.69 × 10 ⁰⁹	0.219
932.055	476130	e	2.0	583420	o	1.0	-3.37	3.35 × 10 ⁰⁶	0.002
933.728	327617	o	1.0	434715	e	1.0	-4.31	3.79 × 10 ⁰⁵	0.004
935.532	380856	e	1.0	487747	o	0.0	-2.25	4.25 × 10 ⁰⁷	0.012
936.169	328941	o	1.0	435759	e	2.0	-2.13	5.59 × 10 ⁰⁷	0.050
936.217	464015	e	2.0	570828	o	3.0	-0.50	2.44 × 10 ⁰⁹	0.309
936.646	464015	e	2.0	570779	o	2.0	-3.63	1.77 × 10 ⁰⁶	0.002
940.408	270561	o	2.0	376898	e	2.0	-1.19	4.85 × 10 ⁰⁸	0.144
941.611	274655	o	2.0	380856	e	1.0	-1.92	9.11 × 10 ⁰⁷	0.018
944.826	277146	o	3.0	382985	e	2.0	-2.07	6.41 × 10 ⁰⁷	0.007
945.413	328941	o	1.0	434715	e	1.0	-5.29	3.84 × 10 ⁰⁴	0.000
946.441	499459	e	0.0	605118	o	1.0	-2.20	4.72 × 10 ⁰⁷	0.419
949.599	382985	e	2.0	488293	o	1.0	-1.97	7.86 × 10 ⁰⁷	0.013
949.703	271602	o	1.0	376898	e	2.0	-1.74	1.34 × 10 ⁰⁸	0.258
956.185	371895	e	1.0	476477	o	1.0	-4.55	2.05 × 10 ⁰⁵	0.000
960.626	274655	o	2.0	378753	e	3.0	-2.28	3.80 × 10 ⁰⁷	0.069
961.311	464015	e	2.0	568040	o	1.0	-1.96	7.88 × 10 ⁰⁷	0.183
972.765	450134	e	2.0	552934	o	3.0	-1.35	3.18 × 10 ⁰⁸	0.027
975.621	434715	e	1.0	537213	o	1.0	-4.38	2.95 × 10 ⁰⁵	0.022
976.683	450134	e	2.0	552521	o	1.0	-4.02	6.70 × 10 ⁰⁵	0.031
978.061	274655	o	2.0	376898	e	2.0	-1.98	7.29 × 10 ⁰⁷	0.024
979.919	434715	e	1.0	536764	o	2.0	-5.15	4.92 × 10 ⁰⁴	0.029
980.704	434715	e	1.0	536682	o	2.0	-0.15	4.92 × 10 ⁰⁹	0.239
982.510	435759	e	2.0	537539	o	3.0	-0.76	1.19 × 10 ⁰⁹	0.141
984.176	277146	o	3.0	378753	e	3.0	-1.68	1.44 × 10 ⁰⁸	0.085
985.665	435759	e	2.0	537213	o	1.0	-4.29	3.53 × 10 ⁰⁵	0.010

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
986.832	270561	o	2.0	371895	e	1.0	-2.62	1.66 × 10 ⁰⁷	0.044
987.386	371895	e	1.0	473173	o	1.0	-1.48	2.28 × 10 ⁰⁸	0.079
990.052	435759	e	2.0	536764	o	2.0	-3.86	9.36 × 10 ⁰⁵	0.052
990.370	435759	e	2.0	536732	o	3.0	-0.15	4.85 × 10 ⁰⁹	0.237
990.853	435759	e	2.0	536682	o	2.0	-0.84	9.79 × 10 ⁰⁸	0.243
992.063	491116	e	1.0	591916	o	1.0	-2.27	3.62 × 10 ⁰⁷	0.194
993.344	470774	e	3.0	571444	o	4.0	-1.21	4.18 × 10 ⁰⁸	0.024
994.700	470774	e	3.0	571306	o	3.0	-2.43	2.50 × 10 ⁰⁷	0.012
995.043	470774	e	3.0	571272	o	4.0	-3.75	1.22 × 10 ⁰⁶	0.000
995.591	371895	e	1.0	472338	o	2.0	-0.24	3.84 × 10 ⁰⁹	0.290
997.073	271602	o	1.0	371895	e	1.0	-2.23	3.96 × 10 ⁰⁷	0.068
998.716	437678	e	3.0	537807	o	4.0	-6.22	4.07 × 10 ⁰³	0.000
998.800	371895	e	1.0	472015	o	2.0	-3.64	1.54 × 10 ⁰⁶	0.000
999.453	470774	e	3.0	570828	o	3.0	-4.42	2.55 × 10 ⁰⁵	0.000
999.942	470774	e	3.0	570779	o	2.0	-2.84	9.72 × 10 ⁰⁶	0.050
1001.391	437678	e	3.0	537539	o	3.0	-1.56	1.82 × 10 ⁰⁸	0.155
1001.765	437678	e	3.0	537502	o	4.0	-0.05	5.92 × 10 ⁰⁹	0.251
1002.484	277146	o	3.0	376898	e	2.0	-1.11	5.11 × 10 ⁰⁸	0.061
1003.112	471762	e	4.0	571452	o	5.0	-1.39	2.71 × 10 ⁰⁸	0.014
1003.198	471762	e	4.0	571444	o	4.0	-2.55	1.88 × 10 ⁰⁷	0.009
1004.221	376898	e	2.0	476477	o	1.0	-1.83	9.89 × 10 ⁰⁷	0.021
1004.582	471762	e	4.0	571306	o	3.0	-4.26	3.67 × 10 ⁰⁵	0.001
1004.931	471762	e	4.0	571272	o	4.0	-2.75	1.18 × 10 ⁰⁷	0.005
1005.634	388853	e	0.0	488293	o	1.0	-1.54	1.89 × 10 ⁰⁸	0.082
1005.923	371895	e	1.0	471306	o	2.0	-2.67	1.41 × 10 ⁰⁷	0.007
1007.923	453681	e	5.0	552895	o	5.0	-3.06	5.74 × 10 ⁰⁶	0.001
1007.925	453681	e	5.0	552895	o	4.0	-2.50	2.10 × 10 ⁰⁷	0.026
1008.012	471762	e	4.0	570968	o	5.0	-2.11	5.11 × 10 ⁰⁷	0.003
1008.091	453681	e	5.0	552878	o	4.0	-3.96	7.28 × 10 ⁰⁵	0.004
1009.226	437678	e	3.0	536764	o	2.0	-3.03	6.12 × 10 ⁰⁶	0.097
1009.430	471762	e	4.0	570828	o	3.0	-2.78	1.10 × 10 ⁰⁷	0.037
1009.556	437678	e	3.0	536732	o	3.0	-0.97	6.98 × 10 ⁰⁸	0.249
1010.059	437678	e	3.0	536682	o	2.0	-2.30	3.29 × 10 ⁰⁷	0.243
1016.315	454539	e	4.0	552934	o	3.0	-2.49	2.08 × 10 ⁰⁷	0.031
1016.716	454539	e	4.0	552895	o	5.0	-1.24	3.68 × 10 ⁰⁸	0.004
1016.718	454539	e	4.0	552895	o	4.0	-2.82	9.87 × 10 ⁰⁶	0.002
1016.886	454539	e	4.0	552878	o	4.0	-3.36	2.81 × 10 ⁰⁶	0.000
1023.246	473715	e	3.0	571444	o	4.0	-4.85	9.06 × 10 ⁰⁴	0.000
1024.110	476130	e	2.0	573776	o	1.0	-2.59	1.65 × 10 ⁰⁷	0.021
1024.686	473715	e	3.0	571306	o	3.0	-3.46	2.20 × 10 ⁰⁶	0.002
1025.049	473715	e	3.0	571272	o	4.0	-1.88	8.38 × 10 ⁰⁷	0.006
1026.230	494472	e	1.0	591916	o	1.0	-1.36	2.66 × 10 ⁰⁸	0.683
1028.377	274655	o	2.0	371895	e	1.0	-2.37	2.71 × 10 ⁰⁷	0.017
1029.607	434715	e	1.0	531839	o	1.0	-4.88	8.22 × 10 ⁰⁴	0.000
1029.730	473715	e	3.0	570828	o	3.0	-3.12	4.72 × 10 ⁰⁶	0.003
1030.249	473715	e	3.0	570779	o	2.0	-4.49	2.05 × 10 ⁰⁵	0.002
1038.483	391998	e	1.0	488293	o	1.0	-0.43	2.29 × 10 ⁰⁹	0.626
1038.691	376898	e	2.0	473173	o	1.0	-0.22	3.75 × 10 ⁰⁹	0.473
1039.617	450134	e	2.0	546323	o	1.0	-2.23	3.66 × 10 ⁰⁷	0.021
1040.800	435759	e	2.0	531839	o	1.0	-2.72	1.17 × 10 ⁰⁷	0.017
1041.623	495912	e	2.0	591916	o	1.0	-1.26	3.53 × 10 ⁰⁸	0.545
1043.754	509310	e	1.0	605118	o	1.0	-6.05	5.52 × 10 ⁰³	0.000
1044.212	491116	e	1.0	586882	o	1.0	-1.97	6.51 × 10 ⁰⁷	0.077
1044.406	391998	e	1.0	487747	o	0.0	-0.58	1.61 × 10 ⁰⁹	0.705
1045.781	376898	e	2.0	472520	o	3.0	-2.87	8.27 × 10 ⁰⁶	0.000

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1045.786	380856	e	1.0	476477	o	1.0	-1.48	2.00 × 10 ⁰⁸	0.015
1047.252	496428	e	2.0	591916	o	1.0	-1.61	1.47 × 10 ⁰⁸	0.434
1047.775	376898	e	2.0	472338	o	2.0	-0.42	2.33 × 10 ⁰⁹	0.333
1048.162	434715	e	1.0	530120	o	2.0	-3.14	4.38 × 10 ⁰⁶	0.026
1048.363	457547	e	3.0	552934	o	3.0	-1.91	7.47 × 10 ⁰⁷	0.010
1048.792	457547	e	3.0	552895	o	4.0	-1.75	1.08 × 10 ⁰⁸	0.004
1048.971	457547	e	3.0	552878	o	4.0	-0.78	1.01 × 10 ⁰⁹	0.017
1049.915	476130	e	2.0	571376	o	1.0	-2.40	2.39 × 10 ⁰⁷	0.285
1050.684	476130	e	2.0	571306	o	3.0	-2.56	1.67 × 10 ⁰⁷	0.002
1051.330	376898	e	2.0	472015	o	2.0	-2.15	4.33 × 10 ⁰⁷	0.003
1052.056	510066	e	1.0	605118	o	1.0	-7.94	6.98 × 10 ⁰¹	0.000
1055.895	435759	e	2.0	530466	o	3.0	-2.94	6.91 × 10 ⁰⁶	0.031
1055.989	476130	e	2.0	570828	o	3.0	-1.57	1.59 × 10 ⁰⁸	0.023
1056.534	476130	e	2.0	570779	o	2.0	-3.42	2.28 × 10 ⁰⁶	0.003
1057.432	434715	e	1.0	529283	o	2.0	-3.13	4.41 × 10 ⁰⁶	0.022
1058.187	458432	e	4.0	552934	o	3.0	-4.51	1.86 × 10 ⁰⁵	0.000
1058.621	458432	e	4.0	552895	o	5.0	-1.04	5.41 × 10 ⁰⁸	0.008
1058.623	458432	e	4.0	552895	o	4.0	-2.14	4.32 × 10 ⁰⁷	0.005
1058.806	458432	e	4.0	552878	o	4.0	-2.25	3.35 × 10 ⁰⁷	0.009
1059.225	376898	e	2.0	471306	o	2.0	-2.25	3.37 × 10 ⁰⁷	0.003
1059.332	340315	o	0.0	434715	e	1.0	-5.28	3.12 × 10 ⁰⁴	0.000
1059.764	435759	e	2.0	530120	o	2.0	-5.62	1.44 × 10 ⁰⁴	0.000
1061.842	510942	e	0.0	605118	o	1.0	-4.94	6.63 × 10 ⁰⁴	0.001
1065.473	511263	e	2.0	605118	o	1.0	-3.73	1.11 × 10 ⁰⁶	0.004
1066.477	378753	e	3.0	472520	o	3.0	-1.76	1.02 × 10 ⁰⁸	0.010
1067.142	434715	e	1.0	528423	o	1.0	-2.19	3.83 × 10 ⁰⁷	0.024
1068.551	378753	e	3.0	472338	o	2.0	0.07	6.81 × 10 ⁰⁹	0.577
1069.056	435759	e	2.0	529300	o	3.0	-3.25	3.28 × 10 ⁰⁶	0.020
1069.242	435759	e	2.0	529283	o	2.0	-2.23	3.43 × 10 ⁰⁷	0.021
1069.365	342246	o	1.0	435759	e	2.0	-4.30	2.95 × 10 ⁰⁵	0.003
1069.607	382985	e	2.0	476477	o	1.0	-3.10	4.62 × 10 ⁰⁶	0.002
1072.249	378753	e	3.0	472015	o	2.0	-0.64	1.33 × 10 ⁰⁹	0.189
1077.733	437678	e	3.0	530466	o	3.0	-2.89	7.34 × 10 ⁰⁶	0.009
1079.171	435759	e	2.0	528423	o	1.0	-1.90	7.21 × 10 ⁰⁷	0.020
1080.463	378753	e	3.0	471306	o	2.0	-4.57	1.53 × 10 ⁰⁵	0.000
1081.444	342246	o	1.0	434715	e	1.0	-5.32	2.75 × 10 ⁰⁴	0.001
1081.584	499459	e	0.0	591916	o	1.0	-1.94	6.66 × 10 ⁰⁷	0.368
1081.764	437678	e	3.0	530120	o	2.0	-3.27	3.03 × 10 ⁰⁶	0.009
1082.134	494472	e	1.0	586882	o	1.0	-2.87	7.33 × 10 ⁰⁶	0.007
1083.222	380856	e	1.0	473173	o	1.0	-0.24	3.29 × 10 ⁰⁹	0.569
1083.377	491116	e	1.0	583420	o	1.0	-2.86	7.92 × 10 ⁰⁶	0.011
1083.450	395995	e	2.0	488293	o	1.0	-0.02	5.41 × 10 ⁰⁹	0.796
1084.135	460694	e	2.0	552934	o	3.0	-1.70	1.12 × 10 ⁰⁸	0.006
1084.999	460768	e	3.0	552934	o	3.0	-2.64	1.29 × 10 ⁰⁷	0.003
1085.458	460768	e	3.0	552895	o	4.0	-1.29	2.90 × 10 ⁰⁸	0.007
1085.650	460768	e	3.0	552878	o	4.0	-2.40	2.23 × 10 ⁰⁷	0.002
1086.435	460477	e	1.0	552521	o	1.0	-4.20	3.55 × 10 ⁰⁵	0.026
1087.047	396300	e	1.0	488293	o	1.0	-0.58	1.48 × 10 ⁰⁹	0.427
1087.451	494760	e	3.0	586718	o	4.0	-5.37	2.41 × 10 ⁰⁴	0.007
1087.608	494760	e	3.0	586705	o	4.0	-3.03	5.26 × 10 ⁰⁶	0.031
1088.023	476130	e	2.0	568040	o	1.0	-3.52	1.66 × 10 ⁰⁶	0.004
1089.004	460694	e	2.0	552521	o	1.0	-4.02	5.41 × 10 ⁰⁵	0.014
1089.547	460477	e	1.0	552258	o	0.0	-3.85	7.95 × 10 ⁰⁵	0.034
1091.447	437678	e	3.0	529300	o	3.0	-6.27	3.04 × 10 ⁰³	0.000
1091.641	437678	e	3.0	529283	o	2.0	-1.84	8.20 × 10 ⁰⁷	0.018

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1093.093	437678	e	3.0	529162	o	4.0	-2.73	1.03×10^{07}	0.039
1093.106	380856	e	1.0	472338	o	2.0	-1.34	2.54×10^{08}	0.046
1093.539	396300	e	1.0	487747	o	0.0	-0.50	1.78×10^{09}	0.760
1096.975	380856	e	1.0	472015	o	2.0	-3.22	3.37×10^{06}	0.000
1099.263	495912	e	2.0	586882	o	1.0	-2.79	9.33×10^{06}	0.005
1105.534	496428	e	2.0	586882	o	1.0	-3.01	5.32×10^{06}	0.006
1105.574	380856	e	1.0	471306	o	2.0	-1.73	1.03×10^{08}	0.005
1106.045	371895	e	1.0	462307	o	1.0	-4.80	8.59×10^{04}	0.000
1108.800	382985	e	2.0	473173	o	1.0	-0.43	2.00×10^{09}	0.473
1116.883	382985	e	2.0	472520	o	3.0	-2.08	4.49×10^{07}	0.002
1119.158	382985	e	2.0	472338	o	2.0	-0.15	3.79×10^{09}	0.427
1123.214	382985	e	2.0	472015	o	2.0	-4.36	2.31×10^{05}	0.000
1124.252	494472	e	1.0	583420	o	1.0	-3.94	5.93×10^{05}	0.001
1124.630	464015	e	2.0	552934	o	3.0	-0.65	1.19×10^{09}	0.038
1129.871	464015	e	2.0	552521	o	1.0	-4.83	7.66×10^{04}	0.001
1132.231	382985	e	2.0	471306	o	2.0	-2.34	2.36×10^{07}	0.007
1141.234	388853	e	0.0	476477	o	1.0	-1.04	4.65×10^{08}	0.050
1142.753	495912	e	2.0	583420	o	1.0	-7.00	5.46×10^{02}	0.000
1143.864	499459	e	0.0	586882	o	1.0	-2.75	9.14×10^{06}	0.019
1144.093	450134	e	2.0	537539	o	3.0	-0.28	2.69×10^{09}	0.385
1148.373	450134	e	2.0	537213	o	1.0	-3.84	7.33×10^{05}	0.045
1149.531	496428	e	2.0	583420	o	1.0	-3.25	2.90×10^{06}	0.010
1154.332	450134	e	2.0	536764	o	2.0	-5.59	1.30×10^{04}	0.032
1154.764	450134	e	2.0	536732	o	3.0	-0.53	1.46×10^{09}	0.299
1155.422	450134	e	2.0	536682	o	2.0	-2.05	4.49×10^{07}	0.369
1164.875	460477	e	1.0	546323	o	1.0	-3.91	6.08×10^{05}	0.007
1166.617	371895	e	1.0	457613	o	2.0	-1.55	1.38×10^{08}	0.073
1167.830	460694	e	2.0	546323	o	1.0	-2.71	9.53×10^{06}	0.027
1168.166	402688	e	0.0	488293	o	1.0	-0.76	8.49×10^{08}	0.534
1170.827	376898	e	2.0	462307	o	1.0	-0.94	5.67×10^{08}	0.270
1183.726	391998	e	1.0	476477	o	1.0	-0.31	2.34×10^{09}	0.358
1185.962	388853	e	0.0	473173	o	1.0	-0.91	5.89×10^{08}	0.267
1188.556	453681	e	5.0	537817	o	5.0	-0.21	2.93×10^{09}	0.538
1188.695	453681	e	5.0	537807	o	4.0	-1.93	5.52×10^{07}	0.535
1191.029	499459	e	0.0	583420	o	1.0	-2.14	3.49×10^{07}	0.024
1193.017	453681	e	5.0	537502	o	4.0	-2.09	3.79×10^{07}	0.093
1194.235	371895	e	1.0	455631	o	2.0	0.13	6.32×10^{09}	0.374
1200.436	453681	e	5.0	536984	o	5.0	-0.83	6.81×10^{08}	0.573
1200.760	453681	e	5.0	536961	o	6.0	0.95	4.13×10^{10}	0.575
1200.802	454539	e	4.0	537817	o	5.0	-0.71	8.99×10^{08}	0.034
1200.943	454539	e	4.0	537807	o	4.0	-0.21	2.86×10^{09}	0.565
1204.813	454539	e	4.0	537539	o	3.0	-1.90	5.82×10^{07}	0.140
1205.355	454539	e	4.0	537502	o	4.0	-1.46	1.61×10^{08}	0.058
1209.775	491116	e	1.0	573776	o	1.0	-2.60	1.13×10^{07}	0.006
1210.566	509310	e	1.0	591916	o	1.0	-3.41	1.79×10^{06}	0.009
1212.928	454539	e	4.0	536984	o	5.0	0.85	3.21×10^{10}	0.603
1214.955	464015	e	2.0	546323	o	1.0	-3.67	9.68×10^{05}	0.001
1216.653	454539	e	4.0	536732	o	3.0	-3.16	3.11×10^{06}	0.009
1217.137	470774	e	3.0	552934	o	3.0	-0.81	7.07×10^{08}	0.156
1217.715	470774	e	3.0	552895	o	4.0	-0.38	1.87×10^{09}	0.115
1217.957	470774	e	3.0	552878	o	4.0	0.73	2.44×10^{10}	0.597
1219.357	371895	e	1.0	453906	o	1.0	0.18	6.80×10^{09}	0.654
1221.747	510066	e	1.0	591916	o	1.0	-3.98	4.64×10^{05}	0.003
1223.911	450134	e	2.0	531839	o	1.0	-2.41	1.72×10^{07}	0.012
1225.100	376898	e	2.0	458524	o	3.0	-1.11	3.48×10^{08}	0.021

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1227.719	380856	e	1.0	462307	o	1.0	-0.07	3.78×10^{09}	0.505
1231.917	391998	e	1.0	473173	o	1.0	-4.07	3.74×10^{05}	0.000
1231.966	471762	e	4.0	552934	o	3.0	-2.26	2.39×10^{07}	0.056
1232.555	471762	e	4.0	552895	o	5.0	0.88	3.33×10^{10}	0.649
1232.558	471762	e	4.0	552895	o	4.0	-0.96	4.87×10^{08}	0.080
1232.805	471762	e	4.0	552878	o	4.0	-0.57	1.17×10^{09}	0.362
1233.901	371895	e	1.0	452939	o	0.0	-0.20	2.78×10^{09}	0.666
1234.964	510942	e	0.0	591916	o	1.0	-5.12	3.29×10^{04}	0.000
1238.921	376898	e	2.0	457613	o	2.0	0.08	5.26×10^{09}	0.673
1239.879	511263	e	2.0	591916	o	1.0	-4.34	2.02×10^{05}	0.001
1242.507	395995	e	2.0	476477	o	1.0	-1.07	3.71×10^{08}	0.133
1244.716	391998	e	1.0	472338	o	2.0	-4.67	9.11×10^{04}	0.000
1244.837	450134	e	2.0	530466	o	3.0	-3.61	1.05×10^{06}	0.025
1245.951	491116	e	1.0	571376	o	1.0	-1.59	1.10×10^{08}	0.220
1245.951	457547	e	3.0	537807	o	4.0	0.74	2.37×10^{10}	0.620
1247.240	396300	e	1.0	476477	o	1.0	-0.46	1.49×10^{09}	0.219
1249.736	391998	e	1.0	472015	o	2.0	-2.45	1.52×10^{07}	0.003
1250.117	457547	e	3.0	537539	o	3.0	-0.20	2.71×10^{09}	0.604
1250.219	450134	e	2.0	530120	o	2.0	-3.82	6.47×10^{05}	0.004
1250.700	457547	e	3.0	537502	o	4.0	-1.63	1.00×10^{08}	0.008
1253.599	378753	e	3.0	458524	o	3.0	0.01	4.33×10^{09}	0.703
1255.283	491116	e	1.0	570779	o	2.0	-5.55	1.19×10^{04}	0.012
1259.695	458432	e	4.0	537817	o	5.0	0.84	2.93×10^{10}	0.681
1259.850	458432	e	4.0	537807	o	4.0	-1.31	2.04×10^{08}	0.069
1260.679	382985	e	2.0	462307	o	1.0	-2.50	1.35×10^{07}	0.011
1260.909	391998	e	1.0	471306	o	2.0	0.50	1.31×10^{10}	0.766
1260.970	494472	e	1.0	573776	o	1.0	-3.08	3.35×10^{06}	0.007
1262.338	473715	e	3.0	552934	o	3.0	-0.69	8.62×10^{08}	0.244
1262.869	457547	e	3.0	536732	o	3.0	-3.60	1.05×10^{06}	0.001
1262.960	473715	e	3.0	552895	o	4.0	0.73	2.24×10^{10}	0.713
1263.170	450134	e	2.0	529300	o	3.0	-3.57	1.13×10^{06}	0.018
1263.220	473715	e	3.0	552878	o	4.0	-0.49	1.34×10^{09}	0.169
1263.430	450134	e	2.0	529283	o	2.0	-5.34	1.92×10^{04}	0.000
1263.655	457547	e	3.0	536682	o	2.0	-2.02	4.03×10^{07}	0.143
1264.111	458432	e	4.0	537539	o	3.0	-1.81	6.49×10^{07}	0.211
1264.707	458432	e	4.0	537502	o	4.0	-0.09	3.37×10^{09}	0.645
1265.381	376898	e	2.0	455925	o	3.0	0.65	1.85×10^{10}	0.693
1268.074	378753	e	3.0	457613	o	2.0	-1.26	2.29×10^{08}	0.456
1270.114	376898	e	2.0	455631	o	2.0	-0.76	7.28×10^{08}	0.138
1273.047	458432	e	4.0	536984	o	5.0	-0.42	1.57×10^{09}	0.083
1277.151	458432	e	4.0	536732	o	3.0	-1.81	6.29×10^{07}	0.176
1277.317	450134	e	2.0	528423	o	1.0	-6.22	2.48×10^{03}	0.000
1284.291	495912	e	2.0	573776	o	1.0	-4.12	3.19×10^{05}	0.001
1289.125	509310	e	1.0	586882	o	1.0	-0.97	4.28×10^{08}	0.780
1292.858	496428	e	2.0	573776	o	1.0	-1.85	5.66×10^{07}	0.181
1295.711	395995	e	2.0	473173	o	1.0	-4.17	2.68×10^{05}	0.000
1295.808	378753	e	3.0	455925	o	3.0	-0.17	2.67×10^{09}	0.742
1298.040	460768	e	3.0	537807	o	4.0	-4.34	1.79×10^{05}	0.000
1298.568	376898	e	2.0	453906	o	1.0	-0.83	5.89×10^{08}	0.367
1299.984	491116	e	1.0	568040	o	1.0	-0.88	5.06×10^{08}	0.204
1300.322	494472	e	1.0	571376	o	1.0	-0.92	4.64×10^{08}	0.654
1300.772	378753	e	3.0	455631	o	2.0	-0.79	6.47×10^{08}	0.330
1300.858	396300	e	1.0	473173	o	1.0	-2.59	1.01×10^{07}	0.004
1301.319	460694	e	2.0	537539	o	3.0	0.27	7.30×10^{09}	0.693
1301.812	510066	e	1.0	586882	o	1.0	-1.34	1.78×10^{08}	0.270

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1302.027	476130	e	2.0	552934	o	3.0	0.64	1.70×10^{10}	0.730
1302.563	460768	e	3.0	537539	o	3.0	-0.85	5.52×10^{08}	0.209
1302.803	380856	e	1.0	457613	o	2.0	0.38	9.33×10^{09}	0.641
1303.161	460477	e	1.0	537213	o	1.0	-4.92	4.76×10^{04}	0.011
1303.196	460768	e	3.0	537502	o	4.0	0.67	1.82×10^{10}	0.707
1303.933	378753	e	3.0	455444	o	4.0	0.80	2.50×10^{10}	0.770
1306.399	494760	e	3.0	571306	o	3.0	-5.18	2.58×10^{04}	0.004
1306.762	395995	e	2.0	472520	o	3.0	0.70	1.94×10^{10}	0.788
1306.860	460694	e	2.0	537213	o	1.0	-4.51	1.21×10^{05}	0.009
1306.990	494760	e	3.0	571272	o	4.0	-3.24	2.26×10^{06}	0.020
1309.056	476130	e	2.0	552521	o	1.0	-6.11	3.05×10^{03}	0.000
1309.877	395995	e	2.0	472338	o	2.0	-2.16	2.67×10^{07}	0.005
1310.491	494472	e	1.0	570779	o	2.0	-3.80	5.95×10^{05}	0.018
1310.839	460477	e	1.0	536764	o	2.0	-5.44	1.42×10^{04}	0.017
1312.245	460477	e	1.0	536682	o	2.0	0.29	7.56×10^{09}	0.836
1314.582	460694	e	2.0	536764	o	2.0	-4.49	1.26×10^{05}	0.016
1314.610	494760	e	3.0	570828	o	3.0	-3.77	6.52×10^{05}	0.025
1315.138	396300	e	1.0	472338	o	2.0	-0.84	5.57×10^{08}	0.095
1315.142	460694	e	2.0	536732	o	3.0	0.05	4.35×10^{09}	0.607
1315.438	395995	e	2.0	472015	o	2.0	-0.43	1.45×10^{09}	0.132
1315.455	494760	e	3.0	570779	o	2.0	-5.18	2.56×10^{04}	0.025
1315.852	460768	e	3.0	536764	o	2.0	-3.84	5.51×10^{05}	0.020
1315.996	460694	e	2.0	536682	o	2.0	-0.22	2.31×10^{09}	0.764
1316.413	460768	e	3.0	536732	o	3.0	-0.23	2.25×10^{09}	0.720
1316.829	510942	e	0.0	586882	o	1.0	-1.56	1.04×10^{08}	0.387
1317.060	454539	e	4.0	530466	o	3.0	-5.65	8.61×10^{03}	0.000
1317.268	460768	e	3.0	536682	o	2.0	-1.56	1.06×10^{08}	0.670
1320.743	396300	e	1.0	472015	o	2.0	0.47	1.13×10^{10}	0.690
1322.419	511263	e	2.0	586882	o	1.0	-0.65	8.61×10^{08}	0.792
1323.826	382985	e	2.0	458524	o	3.0	0.60	1.51×10^{10}	0.759
1324.840	453681	e	5.0	529162	o	4.0	-1.86	5.29×10^{07}	0.016
1325.135	495912	e	2.0	571376	o	1.0	-0.80	6.33×10^{08}	0.555
1326.360	495912	e	2.0	571306	o	3.0	-2.80	6.35×10^{06}	0.032
1327.822	395995	e	2.0	471306	o	2.0	-0.33	1.77×10^{09}	0.372
1332.065	327617	o	1.0	402688	e	0.0	-0.70	7.52×10^{08}	0.158
1333.228	396300	e	1.0	471306	o	2.0	-1.48	1.25×10^{08}	0.024
1334.258	496428	e	2.0	571376	o	1.0	-1.25	2.09×10^{08}	0.347
1334.825	495912	e	2.0	570828	o	3.0	-3.34	1.82×10^{06}	0.006
1335.500	496428	e	2.0	571306	o	3.0	-3.38	1.55×10^{06}	0.020
1335.697	495912	e	2.0	570779	o	2.0	-4.02	3.78×10^{05}	0.022
1337.341	380856	e	1.0	455631	o	2.0	-0.63	8.78×10^{08}	0.122
1337.599	454539	e	4.0	529300	o	3.0	-1.95	4.17×10^{07}	0.020
1339.979	382985	e	2.0	457613	o	2.0	-2.70	7.43×10^{06}	0.002
1340.073	454539	e	4.0	529162	o	4.0	-2.96	4.14×10^{06}	0.027
1344.082	496428	e	2.0	570828	o	3.0	-3.00	3.70×10^{06}	0.030
1344.966	496428	e	2.0	570779	o	2.0	-5.69	7.51×10^{03}	0.002
1345.587	499459	e	0.0	573776	o	1.0	-2.89	4.81×10^{06}	0.012
1349.346	509310	e	1.0	583420	o	1.0	-1.31	1.83×10^{08}	0.384
1355.216	402688	e	0.0	476477	o	1.0	0.02	3.80×10^{09}	0.541
1355.975	328941	o	1.0	402688	e	0.0	-0.88	4.75×10^{08}	0.118
1359.287	494472	e	1.0	568040	o	1.0	-3.35	1.50×10^{06}	0.002
1360.104	464015	e	2.0	537539	o	3.0	0.22	6.01×10^{09}	0.353
1361.388	388853	e	0.0	462307	o	1.0	0.04	3.98×10^{09}	0.741
1363.252	510066	e	1.0	583420	o	1.0	-1.82	5.52×10^{07}	0.073
1366.158	464015	e	2.0	537213	o	1.0	-3.88	4.71×10^{05}	0.008

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1368.924	380856	e	1.0	453906	o	1.0	-1.58	9.46×10^{07}	0.035
1370.986	382985	e	2.0	455925	o	3.0	-1.95	3.97×10^{07}	0.005
1371.388	457547	e	3.0	530466	o	3.0	-4.29	1.81×10^{05}	0.002
1374.599	464015	e	2.0	536764	o	2.0	-6.29	1.80×10^{03}	0.001
1375.211	464015	e	2.0	536732	o	3.0	0.33	7.50×10^{09}	0.736
1376.144	464015	e	2.0	536682	o	2.0	-2.79	5.70×10^{06}	0.004
1376.544	382985	e	2.0	455631	o	2.0	0.20	5.55×10^{09}	0.737
1377.923	457547	e	3.0	530120	o	2.0	-1.92	4.26×10^{07}	0.050
1379.729	510942	e	0.0	583420	o	1.0	-1.44	1.26×10^{08}	0.160
1385.867	511263	e	2.0	583420	o	1.0	-2.04	3.29×10^{07}	0.109
1386.424	495912	e	2.0	568040	o	1.0	-2.68	7.42×10^{06}	0.017
1387.282	380856	e	1.0	452939	o	0.0	-1.31	1.70×10^{08}	0.157
1388.247	458432	e	4.0	530466	o	3.0	-1.67	7.32×10^{07}	0.083
1390.492	499459	e	0.0	571376	o	1.0	-1.80	5.66×10^{07}	0.151
1393.672	457547	e	3.0	529300	o	3.0	-2.23	2.05×10^{07}	0.095
1393.989	457547	e	3.0	529283	o	2.0	-3.74	6.25×10^{05}	0.004
1396.357	457547	e	3.0	529162	o	4.0	-3.73	6.41×10^{05}	0.053
1396.414	496428	e	2.0	568040	o	1.0	-1.95	3.69×10^{07}	0.080
1401.304	460477	e	1.0	531839	o	1.0	-3.86	4.64×10^{05}	0.016
1402.810	325015	o	2.0	396300	e	1.0	-1.13	2.54×10^{08}	0.048
1405.582	460694	e	2.0	531839	o	1.0	-5.18	2.21×10^{04}	0.000
1408.845	325015	o	2.0	395995	e	2.0	-1.51	1.05×10^{08}	0.015
1410.029	382985	e	2.0	453906	o	1.0	-0.46	1.18×10^{09}	0.694
1411.086	458432	e	4.0	529300	o	3.0	-3.42	1.29×10^{06}	0.002
1413.839	458432	e	4.0	529162	o	4.0	-2.19	2.17×10^{07}	0.141
1418.756	402688	e	0.0	473173	o	1.0	-0.81	5.20×10^{08}	0.325
1422.293	391998	e	1.0	462307	o	1.0	-2.99	3.41×10^{06}	0.001
1424.648	476130	e	2.0	546323	o	1.0	-1.88	4.37×10^{07}	0.045
1433.252	460694	e	2.0	530466	o	3.0	-3.70	6.48×10^{05}	0.014
1434.761	460768	e	3.0	530466	o	3.0	-1.88	4.27×10^{07}	0.243
1435.899	460477	e	1.0	530120	o	2.0	-3.26	1.75×10^{06}	0.047
1440.391	460694	e	2.0	530120	o	2.0	-2.35	1.44×10^{07}	0.157
1441.915	460768	e	3.0	530120	o	2.0	-2.57	8.49×10^{06}	0.037
1453.353	460477	e	1.0	529283	o	2.0	-2.95	3.56×10^{06}	0.205
1455.957	327617	o	1.0	396300	e	1.0	-1.96	3.46×10^{07}	0.008
1457.609	460694	e	2.0	529300	o	3.0	-2.84	4.53×10^{06}	0.059
1457.955	460694	e	2.0	529283	o	2.0	-1.85	4.43×10^{07}	0.309
1458.130	499459	e	0.0	568040	o	1.0	-3.16	2.14×10^{06}	0.005
1459.170	460768	e	3.0	529300	o	3.0	-2.96	3.46×10^{06}	0.034
1459.517	460768	e	3.0	529283	o	2.0	-1.42	1.18×10^{08}	0.234
1462.114	460768	e	3.0	529162	o	4.0	-2.53	9.21×10^{06}	0.084
1462.459	327617	o	1.0	395995	e	2.0	-1.89	4.05×10^{07}	0.005
1471.759	460477	e	1.0	528423	o	1.0	-1.85	4.39×10^{07}	0.463
1474.413	464015	e	2.0	531839	o	1.0	-1.72	5.84×10^{07}	0.070
1476.479	460694	e	2.0	528423	o	1.0	-1.59	7.88×10^{07}	0.296
1484.569	328941	o	1.0	396300	e	1.0	-1.58	8.05×10^{07}	0.032
1491.330	328941	o	1.0	395995	e	2.0	-1.30	1.52×10^{08}	0.040
1491.798	470774	e	3.0	537807	o	4.0	-0.61	7.31×10^{08}	0.034
1492.904	325015	o	2.0	391998	e	1.0	-4.05	2.66×10^{05}	0.001
1497.775	470774	e	3.0	537539	o	3.0	-1.38	1.24×10^{08}	0.050
1498.612	470774	e	3.0	537502	o	4.0	-2.78	4.93×10^{06}	0.001
1504.889	464015	e	2.0	530466	o	3.0	-2.18	1.94×10^{07}	0.169
1508.013	395995	e	2.0	462307	o	1.0	-3.93	3.43×10^{05}	0.000
1512.761	464015	e	2.0	530120	o	2.0	-1.98	3.06×10^{07}	0.166
1513.911	471762	e	4.0	537817	o	5.0	-0.87	3.95×10^{08}	0.016

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1514.135	471762	e	4.0	537807	o	4.0	-1.89	3.78×10^{07}	0.016
1514.990	396300	e	1.0	462307	o	1.0	-1.68	6.01×10^{07}	0.017
1515.372	470774	e	3.0	536764	o	2.0	-6.73	5.39×10^{02}	0.002
1516.116	470774	e	3.0	536732	o	3.0	-4.14	2.09×10^{05}	0.000
1517.250	470774	e	3.0	536682	o	2.0	-2.25	1.65×10^{07}	0.100
1520.293	471762	e	4.0	537539	o	3.0	-3.04	2.63×10^{06}	0.012
1521.155	471762	e	4.0	537502	o	4.0	-1.53	8.48×10^{07}	0.029
1524.049	391998	e	1.0	457613	o	2.0	-2.10	2.26×10^{07}	0.003
1531.764	464015	e	2.0	529300	o	3.0	-2.31	1.40×10^{07}	0.078
1532.147	464015	e	2.0	529283	o	2.0	-2.37	1.21×10^{07}	0.123
1533.237	471762	e	4.0	536984	o	5.0	-1.31	1.38×10^{08}	0.008
1537.216	388853	e	0.0	453906	o	1.0	-1.25	1.57×10^{08}	0.084
1539.193	471762	e	4.0	536732	o	3.0	-2.15	2.01×10^{07}	0.086
1551.205	509310	e	1.0	573776	o	1.0	-2.36	1.22×10^{07}	0.040
1552.617	464015	e	2.0	528423	o	1.0	-2.71	5.51×10^{06}	0.044
1553.243	327617	o	1.0	391998	e	1.0	-2.47	9.53×10^{06}	0.002
1560.274	473715	e	3.0	537807	o	4.0	-4.36	1.20×10^{05}	0.000
1566.814	473715	e	3.0	537539	o	3.0	-3.69	5.55×10^{05}	0.000
1567.730	473715	e	3.0	537502	o	4.0	-2.20	1.70×10^{07}	0.001
1569.612	510066	e	1.0	573776	o	1.0	-1.36	1.17×10^{08}	0.117
1571.527	391998	e	1.0	455631	o	2.0	-1.72	5.09×10^{07}	0.031
1585.850	328941	o	1.0	391998	e	1.0	-1.21	1.65×10^{08}	0.074
1586.081	473715	e	3.0	536764	o	2.0	-2.99	2.68×10^{06}	0.081
1586.896	473715	e	3.0	536732	o	3.0	-2.31	1.28×10^{07}	0.006
1588.139	473715	e	3.0	536682	o	2.0	-3.57	7.09×10^{05}	0.007
1591.495	510942	e	0.0	573776	o	1.0	-2.16	1.76×10^{07}	0.074
1599.265	395995	e	2.0	458524	o	3.0	-2.66	5.75×10^{06}	0.001
1599.667	511263	e	2.0	573776	o	1.0	-4.65	5.96×10^{04}	0.000
1611.188	509310	e	1.0	571376	o	1.0	-3.77	4.40×10^{05}	0.001
1615.321	391998	e	1.0	453906	o	1.0	-2.75	4.58×10^{06}	0.006
1622.899	395995	e	2.0	457613	o	2.0	-3.60	6.31×10^{05}	0.000
1626.828	509310	e	1.0	570779	o	2.0	-3.83	3.76×10^{05}	0.004
1628.426	476130	e	2.0	537539	o	3.0	-1.03	2.33×10^{08}	0.020
1628.529	491116	e	1.0	552521	o	1.0	-2.00	2.50×10^{07}	0.011
1630.982	396300	e	1.0	457613	o	2.0	-3.32	1.19×10^{06}	0.000
1631.055	510066	e	1.0	571376	o	1.0	-3.33	1.18×10^{06}	0.003
1633.027	327617	o	1.0	388853	e	0.0	-0.44	9.06×10^{08}	0.494
1635.532	491116	e	1.0	552258	o	0.0	-2.26	1.36×10^{07}	0.010
1637.111	476130	e	2.0	537213	o	1.0	-2.94	2.89×10^{06}	0.043
1640.945	391998	e	1.0	452939	o	0.0	-6.59	6.38×10^{02}	0.000
1647.086	510066	e	1.0	570779	o	2.0	-4.84	3.51×10^{04}	0.003
1649.248	476130	e	2.0	536764	o	2.0	-3.75	4.38×10^{05}	0.091
1650.130	476130	e	2.0	536732	o	3.0	-0.70	4.87×10^{08}	0.067
1651.473	476130	e	2.0	536682	o	2.0	-2.45	8.61×10^{06}	0.010
1654.458	342246	o	1.0	402688	e	0.0	-0.52	7.26×10^{08}	0.460
1654.698	510942	e	0.0	571376	o	1.0	-3.26	1.31×10^{06}	0.007
1663.534	511263	e	2.0	571376	o	1.0	-4.26	1.37×10^{05}	0.000
1665.465	511263	e	2.0	571306	o	3.0	-5.13	1.84×10^{04}	0.000
1668.605	395995	e	2.0	455925	o	3.0	-4.53	7.07×10^{04}	0.000
1669.109	328941	o	1.0	388853	e	0.0	-1.85	3.39×10^{07}	0.026
1675.266	470774	e	3.0	530466	o	3.0	-4.80	3.76×10^{04}	0.001
1676.845	395995	e	2.0	455631	o	2.0	-1.16	1.65×10^{08}	0.045
1677.318	402688	e	0.0	462307	o	1.0	-1.41	9.31×10^{07}	0.032
1678.833	511263	e	2.0	570828	o	3.0	-3.29	1.25×10^{06}	0.005
1680.212	511263	e	2.0	570779	o	2.0	-4.50	7.68×10^{04}	0.005

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1685.028	470774	e	3.0	530120	o	2.0	-2.56	6.43×10^6	0.014
1685.475	396300	e	1.0	455631	o	2.0	-3.63	5.55×10^5	0.000
1702.707	509310	e	1.0	568040	o	1.0	-3.98	2.39×10^5	0.001
1703.488	471762	e	4.0	530466	o	3.0	-2.78	3.76×10^6	0.008
1708.639	470774	e	3.0	529300	o	3.0	-2.75	4.06×10^6	0.035
1709.115	470774	e	3.0	529283	o	2.0	-4.36	1.01×10^5	0.001
1712.678	470774	e	3.0	529162	o	4.0	-4.33	1.08×10^5	0.016
1718.996	494760	e	3.0	552934	o	3.0	-3.35	1.01×10^6	0.219
1720.149	494760	e	3.0	552895	o	4.0	-1.95	2.56×10^7	0.316
1720.631	494760	e	3.0	552878	o	4.0	-3.12	1.71×10^6	0.202
1722.680	494472	e	1.0	552521	o	1.0	-2.96	2.33×10^6	0.001
1724.911	510066	e	1.0	568040	o	1.0	-1.81	3.39×10^7	0.034
1725.024	325015	o	2.0	382985	e	2.0	0.03	2.38×10^9	0.569
1726.799	395995	e	2.0	453906	o	1.0	-1.89	2.92×10^7	0.028
1730.517	494472	e	1.0	552258	o	0.0	-2.86	2.89×10^6	0.002
1735.953	396300	e	1.0	453906	o	1.0	-1.26	1.20×10^8	0.049
1738.006	471762	e	4.0	529300	o	3.0	-3.20	1.40×10^6	0.002
1742.185	471762	e	4.0	529162	o	4.0	-2.71	4.34×10^6	0.042
1743.454	453906	o	1.0	511263	e	2.0	-3.86	2.96×10^5	0.000
1750.483	452939	o	0.0	510066	e	1.0	-2.00	2.20×10^7	0.020
1751.375	510942	e	0.0	568040	o	1.0	-2.25	1.16×10^7	0.049
1753.266	453906	o	1.0	510942	e	0.0	-2.18	1.46×10^7	0.017
1753.724	495912	e	2.0	552934	o	3.0	-1.72	4.35×10^7	0.332
1761.277	511263	e	2.0	568040	o	1.0	-2.76	3.70×10^6	0.011
1762.111	473715	e	3.0	530466	o	3.0	-3.51	6.54×10^5	0.004
1765.582	396300	e	1.0	452939	o	0.0	-1.40	8.51×10^7	0.075
1766.500	495912	e	2.0	552521	o	1.0	-2.98	2.37×10^6	0.001
1769.739	496428	e	2.0	552934	o	3.0	-2.45	7.52×10^6	0.170
1772.914	473715	e	3.0	530120	o	2.0	-4.08	1.76×10^5	0.001
1773.959	452939	o	0.0	509310	e	1.0	-2.26	1.16×10^7	0.072
1780.614	453906	o	1.0	510066	e	1.0	-1.69	4.31×10^7	0.019
1782.750	496428	e	2.0	552521	o	1.0	-2.50	6.62×10^6	0.003
1786.197	340315	o	0.0	396300	e	1.0	-0.28	1.11×10^9	0.542
1790.810	325015	o	2.0	380856	e	1.0	-1.18	1.38×10^8	0.141
1795.049	476130	e	2.0	531839	o	1.0	-4.89	2.62×10^4	0.000
1797.520	455631	o	2.0	511263	e	2.0	-1.43	7.45×10^7	0.034
1799.072	473715	e	3.0	529300	o	3.0	-3.40	8.23×10^5	0.011
1799.600	473715	e	3.0	529283	o	2.0	-2.95	2.30×10^6	0.006
1803.550	473715	e	3.0	529162	o	4.0	-1.98	2.16×10^7	0.180
1804.911	453906	o	1.0	509310	e	1.0	-2.44	7.30×10^6	0.015
1806.094	327617	o	1.0	382985	e	2.0	-0.34	9.33×10^8	0.328
1807.085	455925	o	3.0	511263	e	2.0	-2.38	8.31×10^6	0.001
1811.365	491116	e	1.0	546323	o	1.0	-2.11	1.55×10^7	0.005
1837.047	455631	o	2.0	510066	e	1.0	-2.90	2.48×10^6	0.001
1840.424	476130	e	2.0	530466	o	3.0	-2.27	1.05×10^7	0.084
1849.978	342246	o	1.0	396300	e	1.0	-0.40	7.86×10^8	0.332
1850.333	328941	o	1.0	382985	e	2.0	-0.96	2.12×10^8	0.168
1852.212	476130	e	2.0	530120	o	2.0	-2.08	1.61×10^7	0.093
1860.488	342246	o	1.0	395995	e	2.0	0.18	2.91×10^9	0.592
1860.864	325015	o	2.0	378753	e	3.0	0.35	4.24×10^9	0.606
1862.919	455631	o	2.0	509310	e	1.0	-2.39	7.76×10^6	0.010
1863.936	457613	o	2.0	511263	e	2.0	-2.76	3.22×10^6	0.002
1866.434	434715	e	1.0	488293	o	1.0	-3.33	9.03×10^5	0.227
1878.339	327617	o	1.0	380856	e	1.0	-0.36	8.36×10^8	0.282
1880.781	476130	e	2.0	529300	o	3.0	-1.59	4.80×10^7	0.223

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1881.358	476130	e	2.0	529283	o	2.0	-3.16	1.31×10^6	0.012
1884.584	499459	e	0.0	552521	o	1.0	-3.27	1.03×10^6	0.001
1885.654	434715	e	1.0	487747	o	0.0	-3.01	1.85×10^6	0.351
1896.119	458524	o	3.0	511263	e	2.0	-2.77	3.08×10^6	0.001
1903.544	435759	e	2.0	488293	o	1.0	-2.84	2.68×10^6	0.233
1906.472	457613	o	2.0	510066	e	1.0	-3.15	1.32×10^6	0.001
1912.316	476130	e	2.0	528423	o	1.0	-4.38	7.66×10^4	0.001
1926.234	328941	o	1.0	380856	e	1.0	-0.29	9.16×10^8	0.546
1927.421	325015	o	2.0	376898	e	2.0	-0.26	9.89×10^8	0.589
1928.603	494472	e	1.0	546323	o	1.0	-5.00	1.70×10^4	0.000
1934.352	457613	o	2.0	509310	e	1.0	-2.47	6.01×10^6	0.002
1934.875	340315	o	0.0	391998	e	1.0	-0.41	7.05×10^8	0.529
1952.469	402688	e	0.0	453906	o	1.0	-2.88	2.30×10^6	0.007
1983.694	495912	e	2.0	546323	o	1.0	-4.97	1.93×10^4	0.000
2003.560	496428	e	2.0	546323	o	1.0	-2.52	5.01×10^6	0.005
2009.289	342246	o	1.0	391998	e	1.0	-0.28	8.63×10^8	0.480
2028.539	327617	o	1.0	376898	e	2.0	-0.14	1.17×10^9	0.379
2042.012	462307	o	1.0	511263	e	2.0	-2.22	9.31×10^6	0.019
2055.491	462307	o	1.0	510942	e	0.0	-1.81	2.51×10^7	0.015
2084.541	328941	o	1.0	376898	e	2.0	-0.69	3.13×10^8	0.234
2093.198	462307	o	1.0	510066	e	1.0	-2.11	1.18×10^7	0.009
2126.870	462307	o	1.0	509310	e	1.0	-2.22	8.85×10^6	0.010
2132.420	325015	o	2.0	371895	e	1.0	-0.14	1.06×10^9	0.473
2133.161	499459	e	0.0	546323	o	1.0	-2.97	1.61×10^6	0.000
2144.911	342246	o	1.0	388853	e	0.0	-1.59	3.75×10^7	0.054
2168.639	491116	e	1.0	537213	o	1.0	-1.14	1.01×10^8	0.146
2189.996	491116	e	1.0	536764	o	2.0	-0.14	1.00×10^9	0.613
2193.924	491116	e	1.0	536682	o	2.0	-4.45	4.87×10^4	0.065
2194.540	453906	o	1.0	499459	e	0.0	-1.66	2.94×10^7	0.090
2257.750	327617	o	1.0	371895	e	1.0	-1.50	4.22×10^7	0.077
2313.509	509310	e	1.0	552521	o	1.0	-0.20	7.97×10^8	0.774
2327.335	328941	o	1.0	371895	e	1.0	-1.65	2.75×10^7	0.103
2327.672	509310	e	1.0	552258	o	0.0	-0.55	3.55×10^8	0.572
2336.868	494760	e	3.0	537539	o	3.0	-3.50	3.87×10^5	0.075
2338.908	494760	e	3.0	537502	o	4.0	-1.91	1.49×10^7	0.341
2338.935	494472	e	1.0	537213	o	1.0	-0.07	9.67×10^8	0.841
2350.982	453906	o	1.0	496428	e	2.0	-0.70	2.42×10^8	0.740
2354.709	510066	e	1.0	552521	o	1.0	-0.64	2.75×10^8	0.240
2363.796	494472	e	1.0	536764	o	2.0	-1.11	8.60×10^7	0.277
2368.372	494472	e	1.0	536682	o	2.0	-2.55	3.12×10^6	0.249
2369.383	510066	e	1.0	552258	o	0.0	-0.27	6.37×10^8	0.705
2379.863	453906	o	1.0	495912	e	2.0	-1.14	7.80×10^7	0.489
2380.005	494760	e	3.0	536764	o	2.0	0.30	2.37×10^9	0.836
2381.843	494760	e	3.0	536732	o	3.0	-2.75	2.08×10^6	0.142
2384.644	494760	e	3.0	536682	o	2.0	-4.10	9.37×10^4	0.211
2393.746	434715	e	1.0	476477	o	1.0	-3.14	8.46×10^5	0.007
2399.049	511263	e	2.0	552934	o	3.0	-2.76	2.10×10^6	0.035
2401.544	495912	e	2.0	537539	o	3.0	-1.64	2.85×10^7	0.365
2404.323	510942	e	0.0	552521	o	1.0	-0.58	2.89×10^8	0.643
2406.986	452939	o	0.0	494472	e	1.0	-1.45	4.42×10^7	0.294
2420.490	495912	e	2.0	537213	o	1.0	-0.02	1.17×10^9	0.581
2423.031	511263	e	2.0	552521	o	1.0	0.14	1.63×10^9	0.804
2431.689	496428	e	2.0	537539	o	3.0	-2.23	6.60×10^6	0.272
2447.125	495912	e	2.0	536764	o	2.0	-0.32	5.75×10^8	0.770
2449.068	495912	e	2.0	536732	o	3.0	-2.37	5.18×10^6	0.060

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2450.406	455631	o	2.0	496428	e	2.0	-0.10	8.91 × 10 ⁰⁸	0.751
2451.115	496428	e	2.0	537213	o	1.0	-0.35	4.86 × 10 ⁰⁸	0.498
2452.029	495912	e	2.0	536682	o	2.0	-2.94	1.39 × 10 ⁰⁶	0.187
2453.881	342246	o	1.0	382985	e	2.0	-1.37	4.71 × 10 ⁰⁷	0.035
2454.872	491116	e	1.0	531839	o	1.0	-1.98	1.14 × 10 ⁰⁷	0.018
2455.155	435759	e	2.0	476477	o	1.0	-2.16	7.65 × 10 ⁰⁶	0.032
2464.349	453906	o	1.0	494472	e	1.0	-1.78	1.95 × 10 ⁰⁷	0.055
2465.951	340315	o	0.0	380856	e	1.0	-2.16	7.58 × 10 ⁰⁶	0.010
2468.223	455925	o	3.0	496428	e	2.0	-3.22	6.70 × 10 ⁰⁵	0.001
2478.432	496428	e	2.0	536764	o	2.0	-0.04	9.82 × 10 ⁰⁸	0.810
2480.425	496428	e	2.0	536732	o	3.0	-1.86	1.46 × 10 ⁰⁷	0.408
2481.798	455631	o	2.0	495912	e	2.0	-1.25	5.62 × 10 ⁰⁷	0.118
2483.463	496428	e	2.0	536682	o	2.0	-4.43	3.97 × 10 ⁰⁴	0.026
2500.076	455925	o	3.0	495912	e	2.0	0.32	2.03 × 10 ⁰⁹	0.787
2501.955	471306	o	2.0	511263	e	2.0	-0.65	2.32 × 10 ⁰⁸	0.368
2542.756	455444	o	4.0	494760	e	3.0	0.50	3.25 × 10 ⁰⁹	0.834
2547.154	472015	o	2.0	511263	e	2.0	-0.74	1.82 × 10 ⁰⁸	0.088
2554.870	455631	o	2.0	494760	e	3.0	-0.95	1.13 × 10 ⁰⁸	0.596
2563.091	491116	e	1.0	530120	o	2.0	-2.39	4.00 × 10 ⁰⁶	0.006
2568.273	472338	o	2.0	511263	e	2.0	-3.01	9.59 × 10 ⁰⁵	0.000
2573.815	455631	o	2.0	494472	e	1.0	-1.03	1.02 × 10 ⁰⁸	0.113
2574.244	455925	o	3.0	494760	e	3.0	-0.49	3.26 × 10 ⁰⁸	0.817
2575.559	457613	o	2.0	496428	e	2.0	-2.18	6.74 × 10 ⁰⁶	0.016
2579.227	471306	o	2.0	510066	e	1.0	-1.07	8.49 × 10 ⁰⁷	0.110
2580.339	472520	o	3.0	511263	e	2.0	0.38	2.33 × 10 ⁰⁹	0.888
2589.236	342246	o	1.0	380856	e	1.0	-3.33	4.63 × 10 ⁰⁵	0.000
2599.455	434715	e	1.0	473173	o	1.0	-3.47	3.35 × 10 ⁰⁵	0.050
2610.261	457613	o	2.0	495912	e	2.0	-0.30	4.51 × 10 ⁰⁸	0.725
2618.590	452939	o	0.0	491116	e	1.0	-0.54	2.86 × 10 ⁰⁸	0.698
2619.262	491116	e	1.0	529283	o	2.0	0.25	1.70 × 10 ⁰⁹	0.419
2619.832	450134	e	2.0	488293	o	1.0	-4.30	4.82 × 10 ⁰⁴	0.017
2624.557	473173	o	1.0	511263	e	2.0	-2.86	1.30 × 10 ⁰⁶	0.000
2627.288	472015	o	2.0	510066	e	1.0	0.17	1.43 × 10 ⁰⁹	0.512
2630.538	471306	o	2.0	509310	e	1.0	0.14	1.32 × 10 ⁰⁹	0.833
2637.437	458524	o	3.0	496428	e	2.0	0.29	1.89 × 10 ⁰⁹	0.880
2646.865	473173	o	1.0	510942	e	0.0	-1.67	2.12 × 10 ⁰⁷	0.019
2647.909	499459	e	0.0	537213	o	1.0	-0.58	2.60 × 10 ⁰⁸	0.597
2649.762	472338	o	2.0	510066	e	1.0	-1.81	1.48 × 10 ⁰⁷	0.005
2657.130	434715	e	1.0	472338	o	2.0	-3.78	1.56 × 10 ⁰⁵	0.032
2672.031	435759	e	2.0	473173	o	1.0	-5.18	6.24 × 10 ⁰³	0.001
2673.839	458524	o	3.0	495912	e	2.0	-1.22	5.17 × 10 ⁰⁷	0.044
2675.363	494472	e	1.0	531839	o	1.0	0.02	8.90 × 10 ⁰⁸	0.590
2679.680	491116	e	1.0	528423	o	1.0	0.31	1.88 × 10 ⁰⁹	0.750
2680.120	434715	e	1.0	472015	o	2.0	-3.21	5.70 × 10 ⁰⁵	0.016
2680.548	472015	o	2.0	509310	e	1.0	-1.81	1.42 × 10 ⁰⁷	0.025
2686.623	453906	o	1.0	491116	e	1.0	-0.17	6.40 × 10 ⁰⁸	0.695
2690.875	462307	o	1.0	499459	e	0.0	-0.22	5.36 × 10 ⁰⁸	0.774
2691.216	457613	o	2.0	494760	e	3.0	-1.62	2.20 × 10 ⁰⁷	0.460
2700.952	509310	e	1.0	546323	o	1.0	-0.12	6.99 × 10 ⁰⁸	0.645
2703.948	472338	o	2.0	509310	e	1.0	-3.73	1.67 × 10 ⁰⁵	0.001
2709.716	473173	o	1.0	510066	e	1.0	-7.13	6.85 × 10 ⁰¹	0.000
2712.245	457613	o	2.0	494472	e	1.0	0.07	1.15 × 10 ⁰⁹	0.760
2719.476	435759	e	2.0	472520	o	3.0	-2.49	2.93 × 10 ⁰⁶	0.062
2732.051	434715	e	1.0	471306	o	2.0	-2.78	1.47 × 10 ⁰⁶	0.047
2733.007	435759	e	2.0	472338	o	2.0	-3.32	4.28 × 10 ⁰⁵	0.012

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2757.273	510066	e	1.0	546323	o	1.0	-0.51	2.72×10^{08}	0.163
2757.336	435759	e	2.0	472015	o	2.0	-3.93	1.04×10^{05}	0.000
2758.848	458524	o	3.0	494760	e	3.0	-0.35	3.94×10^{08}	0.815
2766.407	473173	o	1.0	509310	e	1.0	-5.20	5.40×10^{03}	0.000
2782.601	495912	e	2.0	531839	o	1.0	-0.86	1.31×10^{08}	0.340
2799.864	494760	e	3.0	530466	o	3.0	0.17	1.23×10^{09}	0.851
2804.404	494472	e	1.0	530120	o	2.0	0.50	2.45×10^{09}	0.790
2812.333	435759	e	2.0	471306	o	2.0	-2.81	1.30×10^{06}	0.026
2817.247	455631	o	2.0	491116	e	1.0	-0.21	5.33×10^{08}	0.413
2823.150	496428	e	2.0	531839	o	1.0	-1.86	1.12×10^{07}	0.047
2825.544	510942	e	0.0	546323	o	1.0	0.21	1.27×10^{09}	0.893
2827.246	494760	e	3.0	530120	o	2.0	-1.21	5.11×10^{07}	0.481
2851.415	511263	e	2.0	546323	o	1.0	-0.93	9.97×10^{07}	0.188
2869.265	437678	e	3.0	472520	o	3.0	-1.99	8.41×10^{06}	0.085
2871.787	494472	e	1.0	529283	o	2.0	-0.69	1.53×10^{08}	0.089
2873.909	476477	o	1.0	511263	e	2.0	-1.07	6.58×10^{07}	0.149
2884.333	437678	e	3.0	472338	o	2.0	-2.76	1.39×10^{06}	0.018
2884.988	342246	o	1.0	376898	e	2.0	-2.56	2.18×10^{06}	0.002
2893.215	495912	e	2.0	530466	o	3.0	-1.46	3.02×10^{07}	0.009
2894.379	494760	e	3.0	529300	o	3.0	-0.16	5.59×10^{08}	0.891
2895.746	494760	e	3.0	529283	o	2.0	-0.65	1.77×10^{08}	0.473
2900.678	476477	o	1.0	510942	e	0.0	-0.26	4.64×10^{08}	0.576
2905.990	494760	e	3.0	529162	o	4.0	0.94	6.88×10^{09}	0.925
2911.442	437678	e	3.0	472015	o	2.0	-1.22	4.76×10^{07}	0.092
2922.463	495912	e	2.0	530120	o	2.0	0.17	1.26×10^{09}	0.778
2929.924	462307	o	1.0	496428	e	2.0	-2.08	6.55×10^{06}	0.057
2937.077	496428	e	2.0	530466	o	3.0	0.70	3.73×10^{09}	0.887
2944.578	494472	e	1.0	528423	o	1.0	-1.03	6.71×10^{07}	0.120
2967.224	496428	e	2.0	530120	o	2.0	-2.59	1.91×10^{06}	0.002
2972.827	437678	e	3.0	471306	o	2.0	-4.28	4.00×10^{04}	0.001
2974.915	462307	o	1.0	495912	e	2.0	-1.08	5.65×10^{07}	0.416
2976.332	476477	o	1.0	510066	e	1.0	-0.94	8.73×10^{07}	0.136
2983.946	457613	o	2.0	491116	e	1.0	-2.52	2.29×10^{06}	0.016
2994.251	495912	e	2.0	529300	o	3.0	0.78	4.98×10^{09}	0.865
2995.713	495912	e	2.0	529283	o	2.0	-0.63	1.96×10^{08}	0.164
3041.255	496428	e	2.0	529300	o	3.0	-1.26	3.94×10^{07}	0.026
3042.764	496428	e	2.0	529283	o	2.0	0.36	1.62×10^{09}	0.888
3044.867	476477	o	1.0	509310	e	1.0	-0.60	1.79×10^{08}	0.385
3075.007	495912	e	2.0	528423	o	1.0	-0.73	1.48×10^{08}	0.483
3087.430	499459	e	0.0	531839	o	1.0	0.19	1.11×10^{09}	0.844
3108.106	462307	o	1.0	494472	e	1.0	-0.42	2.85×10^{08}	0.554
3124.602	496428	e	2.0	528423	o	1.0	-0.28	3.57×10^{08}	0.854
3165.678	340315	o	0.0	371895	e	1.0	-1.92	8.16×10^{06}	0.033
3371.768	342246	o	1.0	371895	e	1.0	-1.89	7.63×10^{06}	0.034
3451.597	499459	e	0.0	528423	o	1.0	-1.41	2.29×10^{07}	0.070
3470.192	462307	o	1.0	491116	e	1.0	-3.59	1.46×10^{05}	0.001
3582.770	509310	e	1.0	537213	o	1.0	-2.40	2.08×10^{06}	0.008
3594.053	460477	e	1.0	488293	o	1.0	-3.77	8.63×10^{04}	0.113
3622.339	460694	e	2.0	488293	o	1.0	-3.53	1.52×10^{05}	0.073
3623.101	434715	e	1.0	462307	o	1.0	-2.41	1.98×10^{06}	0.053
3641.432	509310	e	1.0	536764	o	2.0	-2.37	2.21×10^{06}	0.066
3652.301	509310	e	1.0	536682	o	2.0	-2.70	1.02×10^{06}	0.081
3666.029	460477	e	1.0	487747	o	0.0	-3.49	1.61×10^{05}	0.174
3682.546	510066	e	1.0	537213	o	1.0	-2.58	1.27×10^{06}	0.005
3744.548	510066	e	1.0	536764	o	2.0	-1.17	3.20×10^{07}	0.113

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3756.043	510066	e	1.0	536682	o	2.0	-4.17	3.19 × 10 ⁰⁴	0.015
3765.649	435759	e	2.0	462307	o	1.0	-1.78	7.86 × 10 ⁰⁶	0.127
3794.896	450134	e	2.0	476477	o	1.0	-1.47	1.57 × 10 ⁰⁷	0.075
3803.183	473173	o	1.0	499459	e	0.0	-0.27	2.38 × 10 ⁰⁸	0.664
3804.645	511263	e	2.0	537539	o	3.0	-4.29	2.49 × 10 ⁰⁴	0.001
3805.340	510942	e	0.0	537213	o	1.0	-2.31	2.09 × 10 ⁰⁶	0.018
3852.413	511263	e	2.0	537213	o	1.0	-3.39	1.94 × 10 ⁰⁵	0.000
3920.320	511263	e	2.0	536764	o	2.0	-2.01	4.48 × 10 ⁰⁶	0.016
3925.307	511263	e	2.0	536732	o	3.0	-2.30	2.28 × 10 ⁰⁶	0.070
3932.921	511263	e	2.0	536682	o	2.0	-3.57	1.23 × 10 ⁰⁵	0.047
3979.497	471306	o	2.0	496428	e	2.0	-7.38	1.79 × 10 ⁰¹	0.000
4062.951	471306	o	2.0	495912	e	2.0	-2.65	7.86 × 10 ⁰⁵	0.006
4095.069	472015	o	2.0	496428	e	2.0	-1.07	3.47 × 10 ⁰⁷	0.058
4117.912	464015	e	2.0	488293	o	1.0	-2.42	1.52 × 10 ⁰⁶	0.325
4149.930	472338	o	2.0	496428	e	2.0	0.25	7.12 × 10 ⁰⁸	0.722
4181.522	472520	o	3.0	496428	e	2.0	-4.04	3.58 × 10 ⁰⁴	0.000
4183.496	472015	o	2.0	495912	e	2.0	-1.27	1.73 × 10 ⁰⁷	0.065
4240.767	472338	o	2.0	495912	e	2.0	-0.11	2.45 × 10 ⁰⁸	0.671
4262.520	471306	o	2.0	494760	e	3.0	-4.22	2.22 × 10 ⁰⁴	0.002
4273.763	472520	o	3.0	495912	e	2.0	-2.72	5.88 × 10 ⁰⁵	0.001
4298.886	473173	o	1.0	496428	e	2.0	-0.05	3.28 × 10 ⁰⁸	0.553
4315.513	471306	o	2.0	494472	e	1.0	-2.78	6.76 × 10 ⁰⁵	0.002
4339.246	450134	e	2.0	473173	o	1.0	-3.40	1.40 × 10 ⁰⁵	0.035
4350.084	476477	o	1.0	499459	e	0.0	-3.26	1.87 × 10 ⁰⁵	0.001
4352.224	488293	o	1.0	511263	e	2.0	0.41	8.44 × 10 ⁰⁸	0.934
4365.871	434715	e	1.0	457613	o	2.0	-3.00	3.48 × 10 ⁰⁵	0.049
4391.551	435759	e	2.0	458524	o	3.0	-2.36	1.50 × 10 ⁰⁶	0.190
4395.390	472015	o	2.0	494760	e	3.0	-0.39	1.39 × 10 ⁰⁸	0.464
4396.438	473173	o	1.0	495912	e	2.0	0.21	4.75 × 10 ⁰⁸	0.661
4413.908	488293	o	1.0	510942	e	0.0	-0.33	1.75 × 10 ⁰⁸	0.781
4437.477	509310	e	1.0	531839	o	1.0	-4.50	1.08 × 10 ⁰⁴	0.000
4451.760	472015	o	2.0	494472	e	1.0	-2.21	2.39 × 10 ⁰⁶	0.006
4458.654	472338	o	2.0	494760	e	3.0	0.52	1.09 × 10 ⁰⁹	0.873
4465.764	450134	e	2.0	472520	o	3.0	-3.29	1.70 × 10 ⁰⁵	0.062
4479.150	487747	o	0.0	510066	e	1.0	0.01	3.41 × 10 ⁰⁸	0.909
4495.142	472520	o	3.0	494760	e	3.0	-2.38	1.35 × 10 ⁰⁶	0.012
4498.257	453906	o	1.0	476130	e	2.0	-3.27	1.76 × 10 ⁰⁵	0.002
4502.369	450134	e	2.0	472338	o	2.0	-3.98	3.44 × 10 ⁰⁴	0.029
4516.669	472338	o	2.0	494472	e	1.0	-0.87	5.08 × 10 ⁰⁷	0.189
4568.773	450134	e	2.0	472015	o	2.0	-3.05	2.88 × 10 ⁰⁵	0.031
4574.539	435759	e	2.0	457613	o	2.0	-2.37	1.35 × 10 ⁰⁶	0.076
4591.494	488293	o	1.0	510066	e	1.0	-0.36	1.39 × 10 ⁰⁸	0.350
4591.558	510066	e	1.0	531839	o	1.0	-2.86	4.30 × 10 ⁰⁵	0.002
4636.189	487747	o	0.0	509310	e	1.0	-0.33	1.41 × 10 ⁰⁸	0.664
4693.676	473173	o	1.0	494472	e	1.0	0.15	4.95 × 10 ⁰⁸	0.825
4721.764	450134	e	2.0	471306	o	2.0	-2.63	7.01 × 10 ⁰⁵	0.060
4756.655	488293	o	1.0	509310	e	1.0	0.01	2.95 × 10 ⁰⁸	0.959
4779.647	434715	e	1.0	455631	o	2.0	-2.19	1.90 × 10 ⁰⁶	0.304
4784.038	510942	e	0.0	531839	o	1.0	-3.81	4.12 × 10 ⁰⁴	0.000
4795.835	437678	e	3.0	458524	o	3.0	-1.40	1.16 × 10 ⁰⁷	0.362
4804.108	509310	e	1.0	530120	o	2.0	-2.54	8.48 × 10 ⁰⁵	0.001
4858.674	511263	e	2.0	531839	o	1.0	-2.65	6.67 × 10 ⁰⁵	0.007
4876.829	455631	o	2.0	476130	e	2.0	-2.90	3.54 × 10 ⁰⁵	0.006
4947.906	455925	o	3.0	476130	e	2.0	-2.18	1.80 × 10 ⁰⁶	0.092
4957.416	435759	e	2.0	455925	o	3.0	-3.46	9.35 × 10 ⁰⁴	0.015

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
4985.220	510066	e	1.0	530120	o	2.0	-4.80	4.10×10^{03}	0.000
5005.288	509310	e	1.0	529283	o	2.0	-1.97	2.92×10^{06}	0.021
5010.983	476477	o	1.0	496428	e	2.0	-2.74	5.05×10^{05}	0.009
5014.904	437678	e	3.0	457613	o	2.0	-2.21	1.66×10^{06}	0.106
5030.879	435759	e	2.0	455631	o	2.0	-1.20	1.68×10^{07}	0.339
5144.029	476477	o	1.0	495912	e	2.0	-1.80	3.33×10^{06}	0.058
5202.196	510066	e	1.0	529283	o	2.0	-1.95	2.78×10^{06}	0.005
5206.205	511263	e	2.0	530466	o	3.0	-3.03	2.36×10^{05}	0.000
5209.325	434715	e	1.0	453906	o	1.0	-1.27	1.31×10^{07}	0.340
5230.639	509310	e	1.0	528423	o	1.0	-4.15	1.84×10^{04}	0.000
5233.948	472015	o	2.0	491116	e	1.0	-0.99	2.56×10^{07}	0.083
5301.680	511263	e	2.0	530120	o	2.0	-4.43	9.40×10^{03}	0.000
5323.900	472338	o	2.0	491116	e	1.0	0.04	2.66×10^{08}	0.639
5398.913	457613	o	2.0	476130	e	2.0	-2.41	8.93×10^{05}	0.013
5446.059	510066	e	1.0	528423	o	1.0	-1.29	1.18×10^{07}	0.046
5471.634	455444	o	4.0	473715	e	3.0	-2.44	8.20×10^{05}	0.072
5478.779	437678	e	3.0	455925	o	3.0	-2.54	6.51×10^{05}	0.113
5485.652	434715	e	1.0	452939	o	0.0	-1.28	1.17×10^{07}	0.341
5509.174	435759	e	2.0	453906	o	1.0	-1.02	2.10×10^{07}	0.267
5528.031	455631	o	2.0	473715	e	3.0	-2.16	1.53×10^{06}	0.006
5542.743	511263	e	2.0	529300	o	3.0	-3.11	1.82×10^{05}	0.000
5547.756	511263	e	2.0	529283	o	2.0	-1.58	6.22×10^{06}	0.021
5555.680	476477	o	1.0	494472	e	1.0	-0.99	2.60×10^{07}	0.166
5559.820	454539	e	4.0	472520	o	3.0	-3.13	1.62×10^{05}	0.001
5568.646	437678	e	3.0	455631	o	2.0	-0.87	2.95×10^{07}	0.260
5571.564	473173	o	1.0	491116	e	1.0	-0.96	2.44×10^{07}	0.200
5619.534	455925	o	3.0	473715	e	3.0	-3.66	4.68×10^{04}	0.001
5627.072	437678	e	3.0	455444	o	4.0	-4.58	5.51×10^{03}	0.001
5678.145	458524	o	3.0	476130	e	2.0	-3.06	1.82×10^{05}	0.019
5718.975	510942	e	0.0	528423	o	1.0	-2.49	6.16×10^{05}	0.008
5825.958	511263	e	2.0	528423	o	1.0	-2.66	4.85×10^{05}	0.006
6126.506	455444	o	4.0	471762	e	4.0	-2.09	1.45×10^{06}	0.040
6208.575	457613	o	2.0	473715	e	3.0	-5.77	2.97×10^{02}	0.000
6248.076	460477	e	1.0	476477	o	1.0	-2.94	1.93×10^{05}	0.024
6312.530	455925	o	3.0	471762	e	4.0	-2.75	2.97×10^{05}	0.001
6334.059	460694	e	2.0	476477	o	1.0	-2.49	5.39×10^{05}	0.016
6521.738	455444	o	4.0	470774	e	3.0	-3.59	3.97×10^{04}	0.040
6580.724	458524	o	3.0	473715	e	3.0	-3.08	1.28×10^{05}	0.003
6602.019	455631	o	2.0	470774	e	3.0	-3.77	2.55×10^{04}	0.001
6676.711	457547	e	3.0	472520	o	3.0	-4.31	7.38×10^{03}	0.000
6732.951	455925	o	3.0	470774	e	3.0	-2.20	9.10×10^{05}	0.032
6758.865	457547	e	3.0	472338	o	2.0	-4.86	2.06×10^{03}	0.000
6829.370	476477	o	1.0	491116	e	1.0	-2.10	1.18×10^{06}	0.042
6909.622	457547	e	3.0	472015	o	2.0	-3.69	2.88×10^{04}	0.001
7096.384	458432	e	4.0	472520	o	3.0	-2.16	9.11×10^{05}	0.006
7232.431	462307	o	1.0	476130	e	2.0	-2.52	3.85×10^{05}	0.004
7265.651	457547	e	3.0	471306	o	2.0	-2.15	9.03×10^{05}	0.007
7551.532	458524	o	3.0	471762	e	4.0	-2.07	9.97×10^{05}	0.008
7596.462	457613	o	2.0	470774	e	3.0	-1.94	1.33×10^{06}	0.013
7874.454	460477	e	1.0	473173	o	1.0	-3.63	2.51×10^{04}	0.071
8011.516	460694	e	2.0	473173	o	1.0	-3.19	6.68×10^{04}	0.054
8022.188	464015	e	2.0	476477	o	1.0	-3.22	6.33×10^{04}	0.001
8161.155	458524	o	3.0	470774	e	3.0	-4.15	7.01×10^{03}	0.001
8212.172	450134	e	2.0	462307	o	1.0	-1.25	5.65×10^{06}	0.322
8219.734	476130	e	2.0	488293	o	1.0	-2.64	2.27×10^{05}	0.196

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
8428.605	460477	e	1.0	472338	o	2.0	-3.89	1.20 × 10 ⁰⁴	0.054
8453.693	460694	e	2.0	472520	o	3.0	-3.15	6.53 × 10 ⁰⁴	0.025
8506.491	460768	e	3.0	472520	o	3.0	-3.34	4.13 × 10 ⁰⁴	0.003
8585.829	460694	e	2.0	472338	o	2.0	-2.93	1.06 × 10 ⁰⁵	0.053
8640.295	460768	e	3.0	472338	o	2.0	-2.31	4.26 × 10 ⁰⁵	0.054
8664.348	460477	e	1.0	472015	o	2.0	-3.24	5.08 × 10 ⁰⁴	0.035
8830.576	460694	e	2.0	472015	o	2.0	-2.33	4.02 × 10 ⁰⁵	0.031
8888.203	460768	e	3.0	472015	o	2.0	-1.69	1.70 × 10 ⁰⁶	0.034
8953.060	488293	o	1.0	499459	e	0.0	-2.85	1.07 × 10 ⁰⁵	0.005
9231.588	460477	e	1.0	471306	o	2.0	-3.22	4.70 × 10 ⁰⁴	0.043
9420.532	460694	e	2.0	471306	o	2.0	-4.40	2.96 × 10 ⁰³	0.001
9486.144	460768	e	3.0	471306	o	2.0	-3.04	6.63 × 10 ⁰⁴	0.006
9888.681	453906	o	1.0	464015	e	2.0	-2.11	5.17 × 10 ⁰⁵	0.058
10917.259	464015	e	2.0	473173	o	1.0	-2.56	1.55 × 10 ⁰⁵	0.116
11755.125	464015	e	2.0	472520	o	3.0	-2.71	9.57 × 10 ⁰⁴	0.068
11915.690	450134	e	2.0	458524	o	3.0	-4.31	2.25 × 10 ⁰³	0.023
11923.364	455631	o	2.0	464015	e	2.0	-2.00	4.64 × 10 ⁰⁵	0.136
12012.188	464015	e	2.0	472338	o	2.0	-5.14	3.42 × 10 ⁰²	0.001
12288.747	488293	o	1.0	496428	e	2.0	-2.24	2.76 × 10 ⁰⁵	0.010
12357.359	455925	o	3.0	464015	e	2.0	-4.00	4.29 × 10 ⁰³	0.004
12496.768	464015	e	2.0	472015	o	2.0	-4.51	1.35 × 10 ⁰³	0.000
13120.976	488293	o	1.0	495912	e	2.0	-4.98	2.40 × 10 ⁰²	0.000
13262.508	452939	o	0.0	460477	e	1.0	-1.18	2.53 × 10 ⁰⁶	0.808
13366.401	450134	e	2.0	457613	o	2.0	-2.04	3.36 × 10 ⁰⁵	0.465
13711.978	464015	e	2.0	471306	o	2.0	-6.09	2.95 × 10 ⁰¹	0.000
14726.769	453906	o	1.0	460694	e	2.0	-0.92	3.71 × 10 ⁰⁶	0.653
14864.941	487747	o	0.0	494472	e	1.0	-2.96	4.97 × 10 ⁰⁴	0.004
15213.531	453906	o	1.0	460477	e	1.0	-1.25	1.65 × 10 ⁰⁶	0.803
15615.120	457613	o	2.0	464015	e	2.0	-1.47	9.09 × 10 ⁰⁵	0.403
16178.642	488293	o	1.0	494472	e	1.0	-5.61	9.71 × 10 ⁰¹	0.000
17261.760	450134	e	2.0	455925	o	3.0	-3.34	1.02 × 10 ⁰⁴	0.236
18186.443	450134	e	2.0	455631	o	2.0	-4.57	5.35 × 10 ⁰²	0.006
18204.326	458524	o	3.0	464015	e	2.0	-4.19	1.27 × 10 ⁰³	0.005
18780.917	455444	o	4.0	460768	e	3.0	-2.95	2.28 × 10 ⁰⁴	0.100
19462.438	455631	o	2.0	460768	e	3.0	-0.73	3.45 × 10 ⁰⁶	0.667
19744.575	455631	o	2.0	460694	e	2.0	-1.27	9.19 × 10 ⁰⁵	0.788
20635.151	455631	o	2.0	460477	e	1.0	-2.32	7.79 × 10 ⁰⁴	0.718
20651.643	455925	o	3.0	460768	e	3.0	-2.31	7.91 × 10 ⁰⁴	0.107
20730.115	471306	o	2.0	476130	e	2.0	-1.72	2.99 × 10 ⁰⁵	0.337
20969.505	455925	o	3.0	460694	e	2.0	-2.82	2.32 × 10 ⁰⁴	0.158
24301.810	472015	o	2.0	476130	e	2.0	-1.88	1.50 × 10 ⁰⁵	0.242
25094.734	454539	e	4.0	458524	o	3.0	-2.70	2.07 × 10 ⁰⁴	0.015
26369.918	472338	o	2.0	476130	e	2.0	-3.00	9.79 × 10 ⁰³	0.133
26511.839	450134	e	2.0	453906	o	1.0	-3.97	1.02 × 10 ⁰³	0.038
27699.297	472520	o	3.0	476130	e	2.0	-3.88	1.16 × 10 ⁰³	0.009
29678.876	487747	o	0.0	491116	e	1.0	-2.45	3.19 × 10 ⁰⁴	0.037
31701.751	457613	o	2.0	460768	e	3.0	-2.22	4.32 × 10 ⁰⁴	0.060
32456.995	457613	o	2.0	460694	e	2.0	-1.94	7.51 × 10 ⁰⁴	0.493
33469.443	455444	o	4.0	458432	e	4.0	-1.61	1.57 × 10 ⁰⁵	0.720
33812.343	473173	o	1.0	476130	e	2.0	-3.57	1.60 × 10 ⁰³	0.024
34918.641	457613	o	2.0	460477	e	1.0	-3.26	3.20 × 10 ⁰³	0.150
35419.546	488293	o	1.0	491116	e	1.0	-2.37	2.77 × 10 ⁰⁴	0.035
39889.428	455925	o	3.0	458432	e	4.0	-5.77	7.30 × 10 ⁰⁰	0.000
41509.279	471306	o	2.0	473715	e	3.0	-3.30	2.02 × 10 ⁰³	0.012
44567.253	458524	o	3.0	460768	e	3.0	-1.54	1.11 × 10 ⁰⁵	0.781

Table A.10. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
46074.458	458524	o	3.0	460694	e	2.0	-2.73	6.16 × 10 ⁰³	0.556
47566.952	455444	o	4.0	457547	e	3.0	-3.21	1.78 × 10 ⁰³	0.680
52194.793	455631	o	2.0	457547	e	3.0	-3.16	1.58 × 10 ⁰³	0.029
54629.885	460477	e	1.0	462307	o	1.0	-3.05	1.99 × 10 ⁰³	0.136
56702.202	453681	e	5.0	455444	o	4.0	-0.79	3.49 × 10 ⁰⁵	0.686
57257.374	470774	e	3.0	472520	o	3.0	-2.26	1.25 × 10 ⁰⁴	0.241
58548.012	462307	o	1.0	464015	e	2.0	-1.33	7.56 × 10 ⁰⁴	0.691
58819.380	472015	o	2.0	473715	e	3.0	-1.08	1.65 × 10 ⁰⁵	0.780
61673.957	455925	o	3.0	457547	e	3.0	-1.81	2.44 × 10 ⁰⁴	0.714
61984.753	460694	e	2.0	462307	o	1.0	-2.73	3.43 × 10 ⁰³	0.067
63918.187	470774	e	3.0	472338	o	2.0	-4.13	1.36 × 10 ⁰²	0.018
72125.617	454539	e	4.0	455925	o	3.0	-1.01	1.29 × 10 ⁰⁵	0.678
72600.554	472338	o	2.0	473715	e	3.0	-2.25	7.77 × 10 ⁰³	0.397
80529.565	470774	e	3.0	472015	o	2.0	-3.00	1.26 × 10 ⁰³	0.033
83654.010	472520	o	3.0	473715	e	3.0	-2.38	4.30 × 10 ⁰³	0.210

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from **Reader & Acquista (1997) and Khan et al. (1981)**.

Table A.11. Calculated HFR oscillator strengths (log *gf*) and transition probabilities (*gA*) in Zr vi. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
165.931	0	o	1.5	602661	e	0.5	-2.02	2.32 × 10 ⁰⁹	0.098
170.341	15603	o	0.5	602661	e	0.5	-1.48	7.65 × 10 ⁰⁹	0.467
173.947	0	o	1.5	574889	e	1.5	-3.12	1.68 × 10 ⁰⁸	0.005
174.066	0	o	1.5	574495	e	2.5	-0.89	2.81 × 10 ¹⁰	0.515
174.428	0	o	1.5	573301	e	1.5	-3.83	3.25 × 10 ⁰⁷	0.002
174.489	0	o	1.5	573102	e	2.5	-2.49	7.02 × 10 ⁰⁸	0.037
178.237	0	o	1.5	561050	e	0.5	-1.25	1.19 × 10 ¹⁰	0.483
178.777	0	o	1.5	559356	e	1.5	-1.26	1.13 × 10 ¹⁰	0.512
178.799	15603	o	0.5	574889	e	1.5	-1.06	1.84 × 10 ¹⁰	0.383
179.144	0	o	1.5	558209	e	0.5	-2.17	1.41 × 10 ⁰⁹	0.413
179.308	15603	o	0.5	573301	e	1.5	-1.32	1.00 × 10 ¹⁰	0.288
182.214	0	o	1.5	548806	e	1.5	-1.83	2.95 × 10 ⁰⁹	0.112
182.551	0	o	1.5	547791	e	0.5	-1.87	2.71 × 10 ⁰⁹	0.056
182.658	0	o	1.5	547472	e	1.5	-0.89	2.59 × 10 ¹⁰	0.238
182.744	0	o	1.5	547214	e	2.5	-1.30	1.01 × 10 ¹⁰	0.246
183.262	0	o	1.5	545666	e	2.5	-1.34	9.18 × 10 ⁰⁹	0.181
183.336	15603	o	0.5	561050	e	0.5	-1.13	1.47 × 10 ¹⁰	0.369
183.347	0	o	1.5	545414	e	2.5	-2.22	1.20 × 10 ⁰⁹	0.170
183.681	0	o	1.5	544423	e	1.5	-0.81	3.09 × 10 ¹⁰	0.235
183.907	15603	o	0.5	559356	e	1.5	-2.07	1.68 × 10 ⁰⁹	0.341
184.062	0	o	1.5	543296	e	0.5	-1.46	6.77 × 10 ⁰⁹	0.104
184.296	15603	o	0.5	558209	e	0.5	-7.81	3.07 × 10 ⁰³	0.000
187.072	0	o	1.5	534553	e	1.5	-1.86	2.62 × 10 ⁰⁹	0.038
187.358	0	o	1.5	533737	e	2.5	-0.96	2.07 × 10 ¹⁰	0.228
187.546	15603	o	0.5	548806	e	1.5	-1.00	1.91 × 10 ¹⁰	0.225
187.828	0	o	1.5	532403	e	2.5	-2.61	4.69 × 10 ⁰⁸	0.116
187.903	15603	o	0.5	547791	e	0.5	-1.17	1.28 × 10 ¹⁰	0.201
188.016	15603	o	0.5	547472	e	1.5	-2.51	5.78 × 10 ⁰⁸	0.017
188.488	0	o	1.5	530539	e	1.5	-2.02	1.79 × 10 ⁰⁹	0.109

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
188.910	0	o	1.5	529352	e	2.5	-3.17	1.27×10^8	0.023
189.044	0	o	1.5	528976	e	1.5	-2.43	6.97×10^8	0.164
189.100	15603	o	0.5	544423	e	1.5	-1.56	5.14×10^9	0.131
189.266	0	o	1.5	528358	e	0.5	-2.64	4.24×10^8	0.073
189.504	15603	o	0.5	543296	e	0.5	-2.26	1.02×10^9	0.026
191.558	0	o	1.5	522036	e	2.5	-0.96	2.01×10^{10}	0.254
191.666	0	o	1.5	521740	e	1.5	-1.24	1.04×10^{10}	0.216
192.697	15603	o	0.5	534553	e	1.5	-1.48	5.96×10^9	0.129
193.632	0	o	1.5	516443	e	0.5	-4.34	8.19×10^6	0.002
194.110	0	o	1.5	515171	e	1.5	-3.31	8.73×10^7	0.013
194.199	15603	o	0.5	530539	e	1.5	-2.01	1.74×10^9	0.062
194.377	0	o	1.5	514465	e	2.5	-5.13	1.31×10^6	0.000
194.790	15603	o	0.5	528976	e	1.5	-3.47	6.03×10^7	0.021
195.025	15603	o	0.5	528358	e	0.5	-2.58	4.60×10^8	0.049
197.575	15603	o	0.5	521740	e	1.5	-2.06	1.51×10^9	0.026
199.664	15603	o	0.5	516443	e	0.5	-2.98	1.75×10^8	0.027
200.173	15603	o	0.5	515171	e	1.5	-3.24	9.54×10^7	0.012
236.282	0	o	1.5	423223	e	0.5	-1.49	3.89×10^9	0.063
245.326	15603	o	0.5	423223	e	0.5	-0.81	1.73×10^{10}	0.426
253.681	0	o	1.5	394195	e	1.5	-1.66	2.26×10^9	0.032
254.094	0	o	1.5	393555	e	2.5	-0.21	6.31×10^{10}	0.545
259.888	0	o	1.5	384781	e	0.5	-0.52	3.00×10^{10}	0.581
263.313	0	o	1.5	379777	e	1.5	-0.28	5.01×10^{10}	0.715
264.136	15603	o	0.5	394195	e	1.5	-0.31	4.73×10^{10}	0.506
264.934	0	o	1.5	377452	e	0.5	-2.12	7.17×10^8	0.147
270.481	0	o	1.5	369712	e	1.5	-0.14	6.62×10^{10}	0.622
270.872	15603	o	0.5	384781	e	0.5	-0.39	3.72×10^{10}	0.507
274.102	0	o	1.5	364827	e	2.5	-1.51	2.73×10^9	0.258
274.594	15603	o	0.5	379777	e	1.5	-1.33	4.14×10^9	0.206
276.358	15603	o	0.5	377452	e	0.5	-3.09	7.10×10^7	0.029
279.199	0	o	1.5	358168	e	1.5	-0.67	1.82×10^{10}	0.044
282.399	15603	o	0.5	369712	e	1.5	-1.36	3.67×10^9	0.085
288.729	0	o	1.5	346346	e	0.5	-0.65	1.79×10^{10}	0.062
290.943	0	o	1.5	343710	e	2.5	1.02	8.37×10^{11}	0.596
291.915	15603	o	0.5	358168	e	1.5	0.82	5.22×10^{11}	0.588
294.392	0	o	1.5	339683	e	1.5	0.75	4.28×10^{11}	0.567
298.780	0	o	1.5	334695	e	0.5	0.47	2.20×10^{11}	0.499
302.350	15603	o	0.5	346346	e	0.5	0.42	1.90×10^{11}	0.553
307.147	0	o	1.5	325577	e	2.5	-2.26	3.87×10^8	0.001
308.566	15603	o	0.5	339683	e	1.5	-1.34	3.16×10^9	0.010
313.150	0	o	1.5	319336	e	1.5	-0.82	1.04×10^{10}	0.073
313.389	15603	o	0.5	334695	e	0.5	-0.52	2.07×10^{10}	0.079
329.236	15603	o	0.5	319336	e	1.5	-0.88	8.08×10^9	0.031
333.769	0	o	1.5	299609	e	2.5	-1.42	2.30×10^9	0.064
340.917	191571	e	0.5	484897	o	1.5	-3.45	2.04×10^7	0.002
343.491	191571	e	0.5	482699	o	0.5	-4.03	5.22×10^6	0.002
348.259	0	o	1.5	287142	e	2.5	-1.79	8.90×10^8	0.010
353.217	0	o	1.5	283112	e	2.5	-1.55	1.52×10^9	0.004
357.837	0	o	1.5	279457	e	1.5	-2.63	1.22×10^8	0.001
358.754	0	o	1.5	278742	e	2.5	-1.68	1.09×10^9	0.009
364.079	0	o	1.5	274666	e	1.5	-1.70	9.96×10^8	0.005
366.095	191571	e	0.5	464724	o	0.5	-1.56	1.38×10^9	0.139
366.523	0	o	1.5	272834	e	1.5	-1.42	1.89×10^9	0.018
367.524	0	o	1.5	272091	e	0.5	-1.53	1.45×10^9	0.107
368.495	0	o	1.5	271374	e	2.5	-1.66	1.07×10^9	0.439

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
368.601	0	o	1.5	271296	e	1.5	-2.28	2.58×10^{08}	0.004
373.822	191571	e	0.5	459078	o	1.5	-2.14	3.43×10^{08}	0.105
375.547	0	o	1.5	266278	e	0.5	-3.45	1.68×10^{07}	0.000
378.347	191571	e	0.5	455878	o	1.5	-1.32	2.26×10^{09}	0.220
378.997	15603	o	0.5	279457	e	1.5	-3.11	3.63×10^{07}	0.000
386.007	15603	o	0.5	274666	e	1.5	-1.63	1.05×10^{09}	0.004
388.755	15603	o	0.5	272834	e	1.5	-3.89	5.70×10^{06}	0.000
389.881	15603	o	0.5	272091	e	0.5	-2.52	1.34×10^{08}	0.009
391.094	15603	o	0.5	271296	e	1.5	-2.74	8.01×10^{07}	0.001
394.775	191571	e	0.5	444879	o	1.5	-3.17	2.88×10^{07}	0.076
395.618	191571	e	0.5	444340	o	0.5	-2.89	5.47×10^{07}	0.037
397.111	0	o	1.5	251819	e	0.5	-3.34	1.93×10^{07}	0.003
398.592	191571	e	0.5	442454	o	1.5	-1.99	4.27×10^{08}	0.168
398.922	15603	o	0.5	266278	e	0.5	-2.65	9.45×10^{07}	0.001
399.972	0	o	1.5	250018	e	1.5	-3.04	3.79×10^{07}	0.002
401.703	0	o	1.5	248940	e	2.5	-2.85	5.87×10^{07}	0.003
406.659	191571	e	0.5	437477	o	1.5	-2.21	2.51×10^{08}	0.054
407.683	191571	e	0.5	436859	o	0.5	-3.03	3.76×10^{07}	0.126
410.076	191571	e	0.5	435428	o	1.5	-4.67	8.50×10^{05}	0.001
411.138	191571	e	0.5	434798	o	0.5	-2.38	1.62×10^{08}	0.083
423.341	15603	o	0.5	251819	e	0.5	-3.52	1.13×10^{07}	0.001
423.806	248940	e	2.5	484897	o	1.5	-3.22	2.24×10^{07}	0.001
425.750	250018	e	1.5	484897	o	1.5	-2.74	6.74×10^{07}	0.002
426.594	15603	o	0.5	250018	e	1.5	-4.18	2.42×10^{06}	0.000
427.154	191571	e	0.5	425678	o	0.5	-2.08	3.06×10^{08}	0.131
429.040	251819	e	0.5	484897	o	1.5	-3.53	1.06×10^{07}	0.000
429.772	250018	e	1.5	482699	o	0.5	-5.30	1.82×10^{05}	0.000
433.124	251819	e	0.5	482699	o	0.5	-4.19	2.30×10^{06}	0.001
435.375	191571	e	0.5	421258	o	1.5	-2.06	3.05×10^{08}	0.159
457.417	266278	e	0.5	484897	o	1.5	-2.66	6.94×10^{07}	0.001
462.063	266278	e	0.5	482699	o	0.5	-2.47	1.03×10^{08}	0.025
465.752	250018	e	1.5	464724	o	0.5	-4.50	9.85×10^{05}	0.000
468.162	271296	e	1.5	484897	o	1.5	-2.08	2.54×10^{08}	0.005
468.334	271374	e	2.5	484897	o	1.5	-3.10	2.46×10^{07}	0.001
469.692	251819	e	0.5	464724	o	0.5	-4.02	2.88×10^{06}	0.001
469.912	272091	e	0.5	484897	o	1.5	-2.82	4.60×10^{07}	0.003
471.558	272834	e	1.5	484897	o	1.5	-2.53	8.92×10^{07}	0.003
473.030	271296	e	1.5	482699	o	0.5	-3.90	3.77×10^{06}	0.000
474.742	248940	e	2.5	459581	o	2.5	-3.61	7.26×10^{06}	0.001
474.816	272091	e	0.5	482699	o	0.5	-3.78	4.87×10^{06}	0.003
475.606	249323	e	3.5	459581	o	2.5	-3.01	2.88×10^{07}	0.003
475.666	274666	e	1.5	484897	o	1.5	-3.03	2.76×10^{07}	0.000
475.879	248940	e	2.5	459078	o	1.5	-3.38	1.23×10^{07}	0.003
476.497	272834	e	1.5	482699	o	0.5	-3.42	1.11×10^{07}	0.002
477.183	250018	e	1.5	459581	o	2.5	-3.88	3.91×10^{06}	0.001
478.332	250018	e	1.5	459078	o	1.5	-5.38	1.22×10^{05}	0.000
480.691	274666	e	1.5	482699	o	0.5	-1.59	7.47×10^{08}	0.056
482.488	251819	e	0.5	459078	o	1.5	-2.91	3.50×10^{07}	0.012
483.236	248940	e	2.5	455878	o	1.5	-3.10	2.29×10^{07}	0.004
485.072	278742	e	2.5	484897	o	1.5	-1.73	5.30×10^{08}	0.014
485.766	250018	e	1.5	455878	o	1.5	-3.92	3.39×10^{06}	0.001
486.760	279457	e	1.5	484897	o	1.5	-1.88	3.70×10^{08}	0.007
490.053	251819	e	0.5	455878	o	1.5	-4.23	1.63×10^{06}	0.001
490.053	248940	e	2.5	453000	o	3.5	-5.25	1.56×10^{05}	0.000
490.974	249323	e	3.5	453000	o	3.5	-1.82	4.19×10^{08}	0.050

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
492.024	279457	e	1.5	482699	o	0.5	-4.22	1.63 × 10 ⁰⁶	0.000
495.576	283112	e	2.5	484897	o	1.5	-1.04	2.50 × 10 ⁰⁹	0.046
498.031	248940	e	2.5	449731	o	2.5	-2.33	1.26 × 10 ⁰⁸	0.036
498.982	249323	e	3.5	449731	o	2.5	-4.69	5.42 × 10 ⁰⁵	0.000
500.718	250018	e	1.5	449731	o	2.5	-3.19	1.71 × 10 ⁰⁷	0.007
503.917	266278	e	0.5	464724	o	0.5	-2.32	1.23 × 10 ⁰⁸	0.013
505.677	287142	e	2.5	484897	o	1.5	-1.57	6.97 × 10 ⁰⁸	0.011
510.362	248940	e	2.5	444879	o	1.5	-2.08	2.15 × 10 ⁰⁸	0.022
513.184	250018	e	1.5	444879	o	1.5	-2.26	1.39 × 10 ⁰⁸	0.018
514.609	250018	e	1.5	444340	o	0.5	-1.89	3.30 × 10 ⁰⁸	0.050
516.760	248940	e	2.5	442454	o	1.5	-1.43	9.22 × 10 ⁰⁸	0.050
516.969	266145	e	3.5	459581	o	2.5	-1.92	3.04 × 10 ⁰⁸	0.042
516.988	271296	e	1.5	464724	o	0.5	-2.90	3.17 × 10 ⁰⁷	0.004
517.972	251819	e	0.5	444879	o	1.5	-2.58	6.58 × 10 ⁰⁷	0.026
518.674	266278	e	0.5	459078	o	1.5	-1.53	7.20 × 10 ⁰⁸	0.098
519.122	272091	e	0.5	464724	o	0.5	-3.68	5.17 × 10 ⁰⁶	0.003
519.423	251819	e	0.5	444340	o	0.5	-2.84	3.60 × 10 ⁰⁷	0.007
519.653	250018	e	1.5	442454	o	1.5	-2.42	9.42 × 10 ⁰⁷	0.007
521.133	272834	e	1.5	464724	o	0.5	-2.86	3.39 × 10 ⁰⁷	0.009
521.880	248940	e	2.5	440555	o	2.5	-1.63	5.70 × 10 ⁰⁸	0.027
522.001	0	o	1.5	191571	e	0.5	-0.82	3.68 × 10 ⁰⁹	0.058
522.584	261643	e	4.5	453000	o	3.5	-5.42	9.29 × 10 ⁰⁴	0.000
522.925	249323	e	3.5	440555	o	2.5	-1.11	1.90 × 10 ⁰⁹	0.059
524.563	251819	e	0.5	442454	o	1.5	-3.35	1.08 × 10 ⁰⁷	0.003
524.832	250018	e	1.5	440555	o	2.5	-1.89	3.15 × 10 ⁰⁸	0.048
526.154	274666	e	1.5	464724	o	0.5	-3.29	1.23 × 10 ⁰⁷	0.001
527.427	266278	e	0.5	455878	o	1.5	-2.71	4.67 × 10 ⁰⁷	0.007
530.400	248940	e	2.5	437477	o	1.5	-2.33	1.12 × 10 ⁰⁸	0.009
531.111	271296	e	1.5	459581	o	2.5	-3.25	1.35 × 10 ⁰⁷	0.005
531.332	271374	e	2.5	459581	o	2.5	-3.02	2.30 × 10 ⁰⁷	0.017
532.534	271296	e	1.5	459078	o	1.5	-1.69	4.77 × 10 ⁰⁸	0.060
532.756	271374	e	2.5	459078	o	1.5	-5.25	1.34 × 10 ⁰⁵	0.000
533.449	250018	e	1.5	437477	o	1.5	-1.48	7.88 × 10 ⁰⁸	0.084
534.798	272091	e	0.5	459078	o	1.5	-2.14	1.67 × 10 ⁰⁸	0.096
535.176	266145	e	3.5	453000	o	3.5	-2.99	2.38 × 10 ⁰⁷	0.004
535.213	250018	e	1.5	436859	o	0.5	-1.28	1.22 × 10 ⁰⁹	0.105
535.486	272834	e	1.5	459581	o	2.5	-1.62	5.59 × 10 ⁰⁸	0.116
536.229	248940	e	2.5	435428	o	1.5	-1.14	1.68 × 10 ⁰⁹	0.093
536.932	272834	e	1.5	459078	o	1.5	-2.07	1.96 × 10 ⁰⁸	0.030
538.624	251819	e	0.5	437477	o	1.5	-1.82	3.52 × 10 ⁰⁸	0.099
539.345	250018	e	1.5	435428	o	1.5	-2.91	2.82 × 10 ⁰⁷	0.002
539.699	299609	e	2.5	484897	o	1.5	-3.90	2.85 × 10 ⁰⁶	0.000
539.762	279457	e	1.5	464724	o	0.5	-2.21	1.39 × 10 ⁰⁸	0.015
540.422	251819	e	0.5	436859	o	0.5	-2.35	1.03 × 10 ⁰⁸	0.013
540.789	274666	e	1.5	459581	o	2.5	-1.33	1.06 × 10 ⁰⁹	0.152
541.184	250018	e	1.5	434798	o	0.5	-1.93	2.66 × 10 ⁰⁸	0.017
541.764	271296	e	1.5	455878	o	1.5	-2.21	1.41 × 10 ⁰⁸	0.018
541.994	271374	e	2.5	455878	o	1.5	-2.33	1.06 × 10 ⁰⁸	0.053
542.264	274666	e	1.5	459078	o	1.5	-1.27	1.22 × 10 ⁰⁹	0.055
544.108	272091	e	0.5	455878	o	1.5	-1.99	2.30 × 10 ⁰⁸	0.068
544.636	251819	e	0.5	435428	o	1.5	-2.50	7.05 × 10 ⁰⁷	0.016
544.706	266145	e	3.5	449731	o	2.5	-2.03	2.12 × 10 ⁰⁸	0.010
546.181	276491	e	3.5	459581	o	2.5	-1.32	1.07 × 10 ⁰⁹	0.065
546.318	272834	e	1.5	455878	o	1.5	-2.74	4.05 × 10 ⁰⁷	0.004
546.511	251819	e	0.5	434798	o	0.5	-1.12	1.71 × 10 ⁰⁹	0.153

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
550.583	271374	e	2.5	453000	o	3.5	-3.40	8.89 × 10 ⁰⁶	0.012
551.259	421258	o	1.5	602661	e	0.5	-5.56	6.03 × 10 ⁰⁴	0.000
551.838	274666	e	1.5	455878	o	1.5	-2.68	4.61 × 10 ⁰⁷	0.003
552.979	278742	e	2.5	459581	o	2.5	-1.25	1.23 × 10 ⁰⁹	0.229
554.522	278742	e	2.5	459078	o	1.5	-3.53	6.37 × 10 ⁰⁶	0.001
555.174	279457	e	1.5	459581	o	2.5	-1.29	1.10 × 10 ⁰⁹	0.153
556.730	279457	e	1.5	459078	o	1.5	-1.59	5.51 × 10 ⁰⁸	0.044
559.569	248940	e	2.5	427649	o	3.5	-1.15	1.50 × 10 ⁰⁹	0.415
559.908	266278	e	0.5	444879	o	1.5	-2.48	6.94 × 10 ⁰⁷	0.019
560.429	271296	e	1.5	449731	o	2.5	-2.07	1.82 × 10 ⁰⁸	0.081
560.675	271374	e	2.5	449731	o	2.5	-3.32	1.03 × 10 ⁰⁷	0.007
560.770	249323	e	3.5	427649	o	3.5	-0.34	9.59 × 10 ⁰⁹	0.559
561.235	248940	e	2.5	427119	o	2.5	-4.72	4.00 × 10 ⁰⁵	0.000
561.603	266278	e	0.5	444340	o	0.5	-2.13	1.55 × 10 ⁰⁸	0.019
562.443	249323	e	3.5	427119	o	2.5	-0.72	4.02 × 10 ⁰⁹	0.250
564.538	278742	e	2.5	455878	o	1.5	-1.25	1.18 × 10 ⁰⁹	0.125
564.649	250018	e	1.5	427119	o	2.5	-2.82	3.19 × 10 ⁰⁷	0.011
565.027	425678	o	0.5	602661	e	0.5	-3.95	2.35 × 10 ⁰⁶	0.001
565.303	272834	e	1.5	449731	o	2.5	-3.02	2.01 × 10 ⁰⁷	0.018
566.545	276491	e	3.5	453000	o	3.5	-2.38	8.65 × 10 ⁰⁷	0.009
566.673	283112	e	2.5	459581	o	2.5	-0.65	4.65 × 10 ⁰⁹	0.251
566.826	279457	e	1.5	455878	o	1.5	-0.95	2.32 × 10 ⁰⁹	0.137
567.617	266278	e	0.5	442454	o	1.5	-1.65	4.58 × 10 ⁰⁸	0.093
568.285	15603	o	0.5	191571	e	0.5	-1.11	1.60 × 10 ⁰⁹	0.064
568.293	283112	e	2.5	459078	o	1.5	-1.94	2.40 × 10 ⁰⁸	0.019
569.280	250018	e	1.5	425678	o	0.5	-0.99	2.14 × 10 ⁰⁹	0.220
571.216	274666	e	1.5	449731	o	2.5	-1.29	1.04 × 10 ⁰⁹	0.181
573.363	266145	e	3.5	440555	o	2.5	-0.57	5.53 × 10 ⁰⁹	0.141
573.863	278742	e	2.5	453000	o	3.5	-1.96	2.20 × 10 ⁰⁸	0.081
575.177	251819	e	0.5	425678	o	0.5	-0.79	3.30 × 10 ⁰⁹	0.458
575.991	285967	e	3.5	459581	o	2.5	-2.80	3.18 × 10 ⁰⁷	0.002
576.092	271296	e	1.5	444879	o	1.5	-2.99	2.09 × 10 ⁰⁷	0.004
576.352	271374	e	2.5	444879	o	1.5	-2.97	2.18 × 10 ⁰⁷	0.009
577.236	276491	e	3.5	449731	o	2.5	-1.01	1.95 × 10 ⁰⁹	0.069
577.864	248940	e	2.5	421991	o	2.5	-0.27	1.08 × 10 ¹⁰	0.549
577.888	271296	e	1.5	444340	o	0.5	-3.20	1.26 × 10 ⁰⁷	0.002
578.744	272091	e	0.5	444879	o	1.5	-1.29	1.03 × 10 ⁰⁹	0.136
578.817	283112	e	2.5	455878	o	1.5	-1.44	7.18 × 10 ⁰⁸	0.039
579.145	249323	e	3.5	421991	o	2.5	-0.12	1.51 × 10 ¹⁰	0.362
579.917	287142	e	2.5	459581	o	2.5	-1.09	1.61 × 10 ⁰⁹	0.170
580.323	248940	e	2.5	421258	o	1.5	-0.44	7.22 × 10 ⁰⁹	0.298
580.556	272091	e	0.5	444340	o	0.5	-2.89	2.55 × 10 ⁰⁷	0.013
581.244	272834	e	1.5	444879	o	1.5	-1.08	1.64 × 10 ⁰⁹	0.181
581.485	250018	e	1.5	421991	o	2.5	-0.92	2.39 × 10 ⁰⁹	0.505
581.614	287142	e	2.5	459078	o	1.5	-1.26	1.08 × 10 ⁰⁹	0.096
583.071	272834	e	1.5	444340	o	0.5	-1.05	1.76 × 10 ⁰⁹	0.230
583.975	250018	e	1.5	421258	o	1.5	-0.40	7.77 × 10 ⁰⁹	0.546
584.117	266278	e	0.5	437477	o	1.5	-1.36	8.47 × 10 ⁰⁸	0.239
584.257	271296	e	1.5	442454	o	1.5	-1.16	1.35 × 10 ⁰⁹	0.191
584.524	271374	e	2.5	442454	o	1.5	-1.33	9.20 × 10 ⁰⁸	0.196
584.835	278742	e	2.5	449731	o	2.5	-3.00	1.94 × 10 ⁰⁷	0.010
586.233	266278	e	0.5	436859	o	0.5	-1.47	6.45 × 10 ⁰⁸	0.156
586.984	272091	e	0.5	442454	o	1.5	-2.41	7.54 × 10 ⁰⁷	0.009
587.290	279457	e	1.5	449731	o	2.5	-2.91	2.38 × 10 ⁰⁷	0.009
587.497	274666	e	1.5	444879	o	1.5	-2.52	5.77 × 10 ⁰⁷	0.009

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
588.624	283112	e	2.5	453000	o	3.5	-1.19	1.23 × 10 ⁰⁹	0.193
589.364	274666	e	1.5	444340	o	0.5	-2.02	1.84 × 10 ⁰⁸	0.018
589.556	272834	e	1.5	442454	o	1.5	-1.08	1.61 × 10 ⁰⁹	0.140
590.182	251819	e	0.5	421258	o	1.5	-0.96	2.11 × 10 ⁰⁹	0.546
590.811	271296	e	1.5	440555	o	2.5	-2.57	5.19 × 10 ⁰⁷	0.023
591.085	271374	e	2.5	440555	o	2.5	-0.92	2.31 × 10 ⁰⁹	0.288
591.194	266278	e	0.5	435428	o	1.5	-2.60	4.72 × 10 ⁰⁷	0.011
592.643	287142	e	2.5	455878	o	1.5	-2.79	3.06 × 10 ⁰⁷	0.004
593.404	266278	e	0.5	434798	o	0.5	-0.76	3.26 × 10 ⁰⁹	0.487
595.723	434798	o	0.5	602661	e	0.5	-3.24	1.08 × 10 ⁰⁷	0.003
595.990	274666	e	1.5	442454	o	1.5	-1.63	4.42 × 10 ⁰⁸	0.045
596.230	272834	e	1.5	440555	o	2.5	-1.80	2.97 × 10 ⁰⁸	0.060
597.967	435428	o	1.5	602661	e	0.5	-3.15	1.34 × 10 ⁰⁷	0.003
598.685	285967	e	3.5	453000	o	3.5	-0.80	2.95 × 10 ⁰⁹	0.408
600.173	283112	e	2.5	449731	o	2.5	-3.82	2.82 × 10 ⁰⁶	0.001
600.282	286412	e	4.5	453000	o	3.5	0.24	3.26 × 10 ¹⁰	0.601
601.754	271296	e	1.5	437477	o	1.5	-1.10	1.47 × 10 ⁰⁹	0.166
601.912	278742	e	2.5	444879	o	1.5	-0.80	2.92 × 10 ⁰⁹	0.139
602.037	271374	e	2.5	437477	o	1.5	-0.41	7.29 × 10 ⁰⁹	0.493
602.387	261643	e	4.5	427649	o	3.5	0.25	3.31 × 10 ¹⁰	0.672
602.812	274666	e	1.5	440555	o	2.5	-2.84	2.66 × 10 ⁰⁷	0.011
602.927	287142	e	2.5	453000	o	3.5	-1.50	5.81 × 10 ⁰⁸	0.249
603.129	436859	o	0.5	602661	e	0.5	-3.44	6.64 × 10 ⁰⁶	0.001
603.999	271296	e	1.5	436859	o	0.5	-0.51	5.66 × 10 ⁰⁹	0.430
604.007	319336	e	1.5	484897	o	1.5	-1.54	5.29 × 10 ⁰⁸	0.018
604.514	279457	e	1.5	444879	o	1.5	-1.01	1.79 × 10 ⁰⁹	0.189
604.647	272091	e	0.5	437477	o	1.5	-1.73	3.36 × 10 ⁰⁸	0.128
605.386	437477	o	1.5	602661	e	0.5	-2.81	2.80 × 10 ⁰⁷	0.004
606.491	279457	e	1.5	444340	o	0.5	-0.67	3.84 × 10 ⁰⁹	0.426
606.915	272091	e	0.5	436859	o	0.5	-3.37	7.76 × 10 ⁰⁶	0.004
607.376	272834	e	1.5	437477	o	1.5	-1.07	1.55 × 10 ⁰⁹	0.153
609.267	271296	e	1.5	435428	o	1.5	-2.82	2.71 × 10 ⁰⁷	0.003
609.520	276491	e	3.5	440555	o	2.5	0.00	1.81 × 10 ¹⁰	0.632
609.558	271374	e	2.5	435428	o	1.5	-0.38	7.49 × 10 ⁰⁹	0.608
609.664	272834	e	1.5	436859	o	0.5	-2.30	9.02 × 10 ⁰⁷	0.009
610.636	285967	e	3.5	449731	o	2.5	0.07	2.09 × 10 ¹⁰	0.532
610.831	278742	e	2.5	442454	o	1.5	-0.49	5.74 × 10 ⁰⁹	0.264
611.614	271296	e	1.5	434798	o	0.5	-0.94	2.05 × 10 ⁰⁹	0.201
612.133	319336	e	1.5	482699	o	0.5	-0.51	5.53 × 10 ⁰⁹	0.399
612.233	272091	e	0.5	435428	o	1.5	-1.11	1.38 × 10 ⁰⁹	0.272
613.510	279457	e	1.5	442454	o	1.5	-3.12	1.35 × 10 ⁰⁷	0.001
614.208	274666	e	1.5	437477	o	1.5	-0.98	1.84 × 10 ⁰⁹	0.183
614.604	272091	e	0.5	434798	o	0.5	-2.57	4.78 × 10 ⁰⁷	0.018
615.032	272834	e	1.5	435428	o	1.5	-1.17	1.19 × 10 ⁰⁹	0.120
615.050	287142	e	2.5	449731	o	2.5	-0.98	1.85 × 10 ⁰⁹	0.217
616.547	274666	e	1.5	436859	o	0.5	-0.90	2.20 × 10 ⁰⁹	0.297
617.424	272834	e	1.5	434798	o	0.5	-1.10	1.40 × 10 ⁰⁹	0.150
617.999	278742	e	2.5	440555	o	2.5	-1.91	2.15 × 10 ⁰⁸	0.034
618.172	283112	e	2.5	444879	o	1.5	-0.71	3.43 × 10 ⁰⁹	0.211
619.181	266145	e	3.5	427649	o	3.5	-1.17	1.19 × 10 ⁰⁹	0.179
620.741	279457	e	1.5	440555	o	2.5	-2.08	1.42 × 10 ⁰⁸	0.035
621.221	266145	e	3.5	427119	o	2.5	-0.05	1.56 × 10 ¹⁰	0.654
622.037	274666	e	1.5	435428	o	1.5	-0.78	2.83 × 10 ⁰⁹	0.277
624.191	442454	o	1.5	602661	e	0.5	-2.68	3.60 × 10 ⁰⁷	0.004
624.484	274666	e	1.5	434798	o	0.5	-1.51	5.28 × 10 ⁰⁸	0.048

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
625.109	299609	e	2.5	459581	o	2.5	-2.00	1.72×10^{08}	0.020
627.081	299609	e	2.5	459078	o	1.5	-0.40	6.70×10^{09}	0.426
627.354	266278	e	0.5	425678	o	0.5	-1.63	3.96×10^{08}	0.066
627.582	283112	e	2.5	442454	o	1.5	-0.95	1.92×10^{09}	0.088
627.666	325577	e	2.5	484897	o	1.5	-0.41	6.62×10^{09}	0.183
629.982	278742	e	2.5	437477	o	1.5	-1.04	1.53×10^{09}	0.260
631.628	444340	o	0.5	602661	e	0.5	-2.91	2.03×10^{07}	0.008
632.832	279457	e	1.5	437477	o	1.5	-1.36	7.26×10^{08}	0.080
633.787	444879	o	1.5	602661	e	0.5	-4.06	1.44×10^{06}	0.001
633.967	287142	e	2.5	444879	o	1.5	-0.39	6.75×10^{09}	0.482
635.151	283112	e	2.5	440555	o	2.5	-1.14	1.20×10^{09}	0.155
635.316	279457	e	1.5	436859	o	0.5	-1.81	2.52×10^{08}	0.049
638.221	278742	e	2.5	435428	o	1.5	-1.12	1.23×10^{09}	0.107
639.899	271374	e	2.5	427649	o	3.5	-2.62	3.90×10^{07}	0.069
639.920	299609	e	2.5	455878	o	1.5	-0.62	3.92×10^{09}	0.469
640.765	303517	e	3.5	459581	o	2.5	-0.01	1.58×10^{10}	0.646
641.147	279457	e	1.5	435428	o	1.5	-1.59	4.08×10^{08}	0.046
641.660	266145	e	3.5	421991	o	2.5	-0.79	2.67×10^{09}	0.198
641.755	271296	e	1.5	427119	o	2.5	-2.36	7.09×10^{07}	0.045
642.078	271374	e	2.5	427119	o	2.5	-1.30	8.26×10^{08}	0.356
643.747	279457	e	1.5	434798	o	0.5	-1.17	1.09×10^{09}	0.140
643.868	287142	e	2.5	442454	o	1.5	-0.50	5.08×10^{09}	0.395
645.247	266278	e	0.5	421258	o	1.5	-1.65	3.51×10^{08}	0.120
646.882	285967	e	3.5	440555	o	2.5	-1.37	6.79×10^{08}	0.105
647.743	271296	e	1.5	425678	o	0.5	-1.22	9.64×10^{08}	0.241
647.815	283112	e	2.5	437477	o	1.5	-0.84	2.32×10^{09}	0.209
648.154	272834	e	1.5	427119	o	2.5	-1.78	2.60×10^{08}	0.099
650.910	421258	o	1.5	574889	e	1.5	-2.41	6.16×10^{07}	0.013
651.097	272091	e	0.5	425678	o	0.5	-1.26	8.65×10^{08}	0.510
651.838	287142	e	2.5	440555	o	2.5	-2.03	1.45×10^{08}	0.054
651.928	299609	e	2.5	453000	o	3.5	-4.08	1.31×10^{06}	0.001
652.584	421258	o	1.5	574495	e	2.5	-2.15	1.10×10^{08}	0.012
654.031	421991	o	2.5	574889	e	1.5	-3.07	1.32×10^{07}	0.004
654.263	272834	e	1.5	425678	o	0.5	-1.05	1.38×10^{09}	0.284
655.722	421991	o	2.5	574495	e	2.5	-2.37	6.64×10^{07}	0.008
655.940	274666	e	1.5	427119	o	2.5	-1.82	2.34×10^{08}	0.088
656.531	283112	e	2.5	435428	o	1.5	-0.97	1.67×10^{09}	0.119
657.708	421258	o	1.5	573301	e	1.5	-4.43	5.78×10^{05}	0.000
658.571	421258	o	1.5	573102	e	2.5	-5.03	1.44×10^{05}	0.000
660.895	421991	o	2.5	573301	e	1.5	-4.14	1.10×10^{06}	0.001
661.560	276491	e	3.5	427649	o	3.5	-1.80	2.39×10^{08}	0.054
661.767	421991	o	2.5	573102	e	2.5	-4.14	1.11×10^{06}	0.000
662.197	274666	e	1.5	425678	o	0.5	-1.24	8.70×10^{08}	0.106
663.591	271296	e	1.5	421991	o	2.5	-1.84	2.22×10^{08}	0.152
663.890	276491	e	3.5	427119	o	2.5	-0.60	3.79×10^{09}	0.137
663.936	271374	e	2.5	421991	o	2.5	-1.78	2.53×10^{08}	0.082
665.183	287142	e	2.5	437477	o	1.5	-2.23	8.82×10^{07}	0.024
665.769	334695	e	0.5	484897	o	1.5	-2.54	4.35×10^{07}	0.004
666.125	299609	e	2.5	449731	o	2.5	-0.69	3.05×10^{09}	0.271
666.836	271296	e	1.5	421258	o	1.5	-1.77	2.54×10^{08}	0.070
667.184	271374	e	2.5	421258	o	1.5	-1.77	2.56×10^{08}	0.076
668.974	303517	e	3.5	453000	o	3.5	-0.53	4.43×10^{09}	0.365
670.192	425678	o	0.5	574889	e	1.5	-1.85	2.09×10^{08}	0.026
670.391	272091	e	0.5	421258	o	1.5	-0.90	1.87×10^{09}	0.323
670.436	272834	e	1.5	421991	o	2.5	-1.45	5.23×10^{08}	0.139

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
671.561	278742	e	2.5	427649	o	3.5	-5.25	8.24 × 10 ⁰⁴	0.000
673.748	272834	e	1.5	421258	o	1.5	-1.42	5.64 × 10 ⁰⁸	0.081
673.962	278742	e	2.5	427119	o	2.5	-0.93	1.72 × 10 ⁰⁹	0.333
674.376	287142	e	2.5	435428	o	1.5	-1.54	4.21 × 10 ⁰⁸	0.042
675.656	334695	e	0.5	482699	o	0.5	-2.21	9.08 × 10 ⁰⁷	0.046
676.725	427119	o	2.5	574889	e	1.5	-2.52	4.38 × 10 ⁰⁷	0.004
677.225	279457	e	1.5	427119	o	2.5	-2.85	2.04 × 10 ⁰⁷	0.006
677.401	425678	o	0.5	573301	e	1.5	-2.77	2.46 × 10 ⁰⁷	0.001
678.535	427119	o	2.5	574495	e	2.5	-7.15	1.02 × 10 ⁰³	0.000
678.769	274666	e	1.5	421991	o	2.5	-4.70	2.86 × 10 ⁰⁵	0.000
680.987	427649	o	3.5	574495	e	2.5	-2.65	3.24 × 10 ⁰⁷	0.003
681.279	455878	o	1.5	602661	e	0.5	-1.90	1.80 × 10 ⁰⁸	0.088
682.164	274666	e	1.5	421258	o	1.5	-1.91	1.77 × 10 ⁰⁸	0.033
683.897	279457	e	1.5	425678	o	0.5	-3.25	7.93 × 10 ⁰⁶	0.001
683.931	303517	e	3.5	449731	o	2.5	-1.61	3.47 × 10 ⁰⁸	0.045
684.076	427119	o	2.5	573301	e	1.5	-6.00	1.44 × 10 ⁰⁴	0.000
685.010	427119	o	2.5	573102	e	2.5	-3.50	4.47 × 10 ⁰⁶	0.001
687.286	276491	e	3.5	421991	o	2.5	-3.20	8.81 × 10 ⁰⁶	0.001
687.509	427649	o	3.5	573102	e	2.5	-5.07	1.19 × 10 ⁰⁵	0.000
687.815	319336	e	1.5	464724	o	0.5	-0.83	2.08 × 10 ⁰⁹	0.385
688.370	299609	e	2.5	444879	o	1.5	-1.38	5.85 × 10 ⁰⁸	0.145
688.637	339683	e	1.5	484897	o	1.5	-1.66	3.10 × 10 ⁰⁸	0.016
691.864	283112	e	2.5	427649	o	3.5	-2.74	2.52 × 10 ⁰⁷	0.015
694.412	283112	e	2.5	427119	o	2.5	-1.98	1.46 × 10 ⁰⁸	0.020
696.460	459078	o	1.5	602661	e	0.5	-2.77	2.33 × 10 ⁰⁷	0.030
698.085	278742	e	2.5	421991	o	2.5	-1.02	1.31 × 10 ⁰⁹	0.189
699.220	339683	e	1.5	482699	o	0.5	-2.13	1.01 × 10 ⁰⁸	0.038
700.060	299609	e	2.5	442454	o	1.5	-1.43	5.07 × 10 ⁰⁸	0.133
701.587	279457	e	1.5	421991	o	2.5	-1.60	3.40 × 10 ⁰⁸	0.113
701.677	278742	e	2.5	421258	o	1.5	-1.24	7.85 × 10 ⁰⁸	0.086
705.215	279457	e	1.5	421258	o	1.5	-2.25	7.39 × 10 ⁰⁷	0.012
705.806	285967	e	3.5	427649	o	3.5	-2.82	2.03 × 10 ⁰⁷	0.021
708.027	286412	e	4.5	427649	o	3.5	-4.79	2.18 × 10 ⁰⁵	0.000
708.277	343710	e	2.5	484897	o	1.5	-1.65	2.94 × 10 ⁰⁸	0.020
708.458	285967	e	3.5	427119	o	2.5	-1.40	5.32 × 10 ⁰⁸	0.038
709.490	299609	e	2.5	440555	o	2.5	-1.81	2.05 × 10 ⁰⁸	0.186
711.710	287142	e	2.5	427649	o	3.5	-2.99	1.35 × 10 ⁰⁷	0.041
713.040	319336	e	1.5	459581	o	2.5	-4.50	4.16 × 10 ⁰⁵	0.000
713.820	434798	o	0.5	574889	e	1.5	-1.57	3.52 × 10 ⁰⁸	0.068
714.407	287142	e	2.5	427119	o	2.5	-5.26	7.16 × 10 ⁰⁴	0.000
715.347	421258	o	1.5	561050	e	0.5	-2.61	3.22 × 10 ⁰⁷	0.010
715.607	319336	e	1.5	459078	o	1.5	-1.22	7.77 × 10 ⁰⁸	0.146
717.044	435428	o	1.5	574889	e	1.5	-2.46	4.55 × 10 ⁰⁷	0.008
719.077	435428	o	1.5	574495	e	2.5	-1.63	3.06 × 10 ⁰⁸	0.114
720.050	283112	e	2.5	421991	o	2.5	-1.53	3.83 × 10 ⁰⁸	0.065
721.752	346346	e	0.5	484897	o	1.5	-2.76	2.28 × 10 ⁰⁷	0.001
722.004	434798	o	0.5	573301	e	1.5	-2.30	6.46 × 10 ⁰⁷	0.003
723.872	283112	e	2.5	421258	o	1.5	-2.06	1.12 × 10 ⁰⁸	0.011
724.121	421258	o	1.5	559356	e	1.5	-1.95	1.41 × 10 ⁰⁸	0.015
724.480	436859	o	0.5	574889	e	1.5	-3.55	3.62 × 10 ⁰⁶	0.002
724.969	464724	o	0.5	602661	e	0.5	-4.62	3.05 × 10 ⁰⁵	0.000
725.303	435428	o	1.5	573301	e	1.5	-3.72	2.44 × 10 ⁰⁶	0.000
725.330	299609	e	2.5	437477	o	1.5	-1.95	1.42 × 10 ⁰⁸	0.071
726.353	435428	o	1.5	573102	e	2.5	-2.64	2.87 × 10 ⁰⁷	0.001
727.738	437477	o	1.5	574889	e	1.5	-2.08	1.05 × 10 ⁰⁸	0.022

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
727.986	421991	o	2.5	559356	e	1.5	-1.77	2.14 × 10 ⁰⁸	0.012
729.726	303517	e	3.5	440555	o	2.5	-1.46	4.35 × 10 ⁰⁸	0.096
729.832	437477	o	1.5	574495	e	2.5	-0.87	1.70 × 10 ⁰⁹	0.331
730.189	421258	o	1.5	558209	e	0.5	-1.39	5.14 × 10 ⁰⁸	0.046
732.375	319336	e	1.5	455878	o	1.5	-1.26	6.90 × 10 ⁰⁸	0.154
732.912	436859	o	0.5	573301	e	1.5	-2.77	2.13 × 10 ⁰⁷	0.001
733.387	346346	e	0.5	482699	o	0.5	-3.46	4.40 × 10 ⁰⁶	0.002
735.164	285967	e	3.5	421991	o	2.5	-3.17	8.39 × 10 ⁰⁶	0.003
736.246	437477	o	1.5	573301	e	1.5	-4.84	1.79 × 10 ⁰⁵	0.000
736.274	299609	e	2.5	435428	o	1.5	-1.30	6.13 × 10 ⁰⁸	0.152
737.328	437477	o	1.5	573102	e	2.5	-2.72	2.33 × 10 ⁰⁷	0.001
738.704	425678	o	0.5	561050	e	0.5	-1.77	2.05 × 10 ⁰⁸	0.048
741.571	287142	e	2.5	421991	o	2.5	-3.23	7.03 × 10 ⁰⁶	0.005
744.412	440555	o	2.5	574889	e	1.5	-2.87	1.63 × 10 ⁰⁷	0.006
745.626	287142	e	2.5	421258	o	1.5	-2.84	1.72 × 10 ⁰⁷	0.006
746.247	325577	e	2.5	459581	o	2.5	-1.06	1.06 × 10 ⁰⁹	0.335
746.603	440555	o	2.5	574495	e	2.5	-2.54	3.49 × 10 ⁰⁷	0.012
748.065	425678	o	0.5	559356	e	1.5	-1.47	3.98 × 10 ⁰⁸	0.067
749.059	325577	e	2.5	459078	o	1.5	-3.74	2.18 × 10 ⁰⁶	0.001
753.317	440555	o	2.5	573301	e	1.5	-6.40	4.65 × 10 ⁰³	0.000
754.450	440555	o	2.5	573102	e	2.5	-5.92	1.40 × 10 ⁰⁴	0.000
754.543	425678	o	0.5	558209	e	0.5	-1.53	3.47 × 10 ⁰⁸	0.200
755.085	442454	o	1.5	574889	e	1.5	-5.53	3.47 × 10 ⁰⁴	0.000
756.213	427119	o	2.5	559356	e	1.5	-2.19	7.55 × 10 ⁰⁷	0.006
757.339	442454	o	1.5	574495	e	2.5	-1.07	9.87 × 10 ⁰⁸	0.165
764.249	442454	o	1.5	573301	e	1.5	-2.98	1.19 × 10 ⁰⁷	0.001
765.414	442454	o	1.5	573102	e	2.5	-2.83	1.68 × 10 ⁰⁷	0.001
765.995	444340	o	0.5	574889	e	1.5	-1.37	4.78 × 10 ⁰⁸	0.135
766.903	319336	e	1.5	449731	o	2.5	-2.14	8.26 × 10 ⁰⁷	0.057
767.452	325577	e	2.5	455878	o	1.5	-2.13	8.41 × 10 ⁰⁷	0.019
769.058	334695	e	0.5	464724	o	0.5	-2.02	1.09 × 10 ⁰⁸	0.023
769.173	444879	o	1.5	574889	e	1.5	-2.16	7.79 × 10 ⁰⁷	0.036
771.512	444879	o	1.5	574495	e	2.5	-2.58	2.93 × 10 ⁰⁷	0.016
775.428	444340	o	0.5	573301	e	1.5	-2.42	4.21 × 10 ⁰⁷	0.003
778.684	444879	o	1.5	573301	e	1.5	-2.88	1.43 × 10 ⁰⁷	0.003
779.894	444879	o	1.5	573102	e	2.5	-3.93	1.29 × 10 ⁰⁶	0.000
781.003	299609	e	2.5	427649	o	3.5	-4.29	5.55 × 10 ⁰⁵	0.003
784.021	421258	o	1.5	548806	e	1.5	-5.65	2.43 × 10 ⁰⁴	0.000
784.252	299609	e	2.5	427119	o	2.5	-1.55	3.04 × 10 ⁰⁸	0.130
784.787	325577	e	2.5	453000	o	3.5	-2.44	3.89 × 10 ⁰⁷	0.026
788.554	421991	o	2.5	548806	e	1.5	-4.48	3.60 × 10 ⁰⁵	0.000
789.084	358168	e	1.5	484897	o	1.5	-1.96	1.18 × 10 ⁰⁸	0.007
790.307	421258	o	1.5	547791	e	0.5	-3.48	3.58 × 10 ⁰⁶	0.001
792.063	434798	o	0.5	561050	e	0.5	-1.79	1.73 × 10 ⁰⁸	0.056
792.305	421258	o	1.5	547472	e	1.5	-0.83	1.56 × 10 ⁰⁹	0.153
793.928	421258	o	1.5	547214	e	2.5	-3.90	1.34 × 10 ⁰⁶	0.000
796.035	435428	o	1.5	561050	e	0.5	-1.09	8.66 × 10 ⁰⁸	0.125
796.539	319336	e	1.5	444879	o	1.5	-2.00	1.04 × 10 ⁰⁸	0.144
796.935	421991	o	2.5	547472	e	1.5	-1.60	2.63 × 10 ⁰⁸	0.032
798.577	421991	o	2.5	547214	e	2.5	-3.68	2.20 × 10 ⁰⁶	0.000
798.987	449731	o	2.5	574889	e	1.5	-0.01	1.01 × 10 ¹⁰	0.588
799.736	339683	e	1.5	464724	o	0.5	-5.68	2.22 × 10 ⁰⁴	0.000
799.975	319336	e	1.5	444340	o	0.5	-1.51	3.26 × 10 ⁰⁸	0.174
801.512	449731	o	2.5	574495	e	2.5	-0.54	2.98 × 10 ⁰⁹	0.780
802.834	434798	o	0.5	559356	e	1.5	-0.47	3.53 × 10 ⁰⁹	0.643

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
803.012	358168	e	1.5	482699	o	0.5	-0.63	2.41 × 10 ⁰⁹	0.407
803.806	421258	o	1.5	545666	e	2.5	-1.38	4.36 × 10 ⁰⁸	0.021
803.970	334695	e	0.5	459078	o	1.5	-1.22	6.16 × 10 ⁰⁸	0.343
805.210	436859	o	0.5	561050	e	0.5	-3.95	1.17 × 10 ⁰⁶	0.001
805.441	421258	o	1.5	545414	e	2.5	-0.23	6.08 × 10 ⁰⁹	0.512
805.452	325577	e	2.5	449731	o	2.5	-2.21	6.35 × 10 ⁰⁷	0.072
805.595	303517	e	3.5	427649	o	3.5	-2.14	7.33 × 10 ⁰⁷	0.059
806.915	435428	o	1.5	559356	e	1.5	-1.84	1.48 × 10 ⁰⁸	0.014
808.572	421991	o	2.5	545666	e	2.5	-1.31	5.05 × 10 ⁰⁸	0.034
809.052	303517	e	3.5	427119	o	2.5	-1.48	3.36 × 10 ⁰⁸	0.057
809.236	437477	o	1.5	561050	e	0.5	-1.44	3.68 × 10 ⁰⁸	0.125
809.255	449731	o	2.5	573301	e	1.5	-2.32	4.93 × 10 ⁰⁷	0.021
810.226	421991	o	2.5	545414	e	2.5	0.06	1.16 × 10 ¹⁰	0.586
810.301	434798	o	0.5	558209	e	0.5	-1.60	2.53 × 10 ⁰⁸	0.070
810.562	449731	o	2.5	573102	e	2.5	-4.64	2.31 × 10 ⁰⁵	0.000
811.919	421258	o	1.5	544423	e	1.5	-2.92	1.22 × 10 ⁰⁷	0.001
812.167	425678	o	0.5	548806	e	1.5	-2.40	4.08 × 10 ⁰⁷	0.003
812.232	319336	e	1.5	442454	o	1.5	-2.26	5.59 × 10 ⁰⁷	0.035
814.458	435428	o	1.5	558209	e	0.5	-0.85	1.43 × 10 ⁰⁹	0.208
816.344	436859	o	0.5	559356	e	1.5	-1.75	1.79 × 10 ⁰⁸	0.049
816.781	421991	o	2.5	544423	e	1.5	-2.79	1.62 × 10 ⁰⁷	0.003
817.110	299609	e	2.5	421991	o	2.5	-2.38	4.19 × 10 ⁰⁷	0.053
818.915	425678	o	0.5	547791	e	0.5	-2.24	5.77 × 10 ⁰⁷	0.005
819.418	421258	o	1.5	543296	e	0.5	-2.42	3.78 × 10 ⁰⁷	0.004
820.483	437477	o	1.5	559356	e	1.5	-0.39	4.05 × 10 ⁰⁹	0.518
821.060	425678	o	0.5	547472	e	1.5	-0.51	3.02 × 10 ⁰⁹	0.359
821.781	427119	o	2.5	548806	e	1.5	-2.80	1.57 × 10 ⁰⁷	0.005
822.035	299609	e	2.5	421258	o	1.5	-2.65	2.22 × 10 ⁰⁷	0.018
823.079	453000	o	3.5	574495	e	2.5	0.20	1.56 × 10 ¹⁰	0.758
824.065	436859	o	0.5	558209	e	0.5	-0.46	3.44 × 10 ⁰⁹	0.732
824.955	319336	e	1.5	440555	o	2.5	-4.21	6.01 × 10 ⁰⁵	0.003
825.197	334695	e	0.5	455878	o	1.5	-0.84	1.42 × 10 ⁰⁹	0.327
828.283	437477	o	1.5	558209	e	0.5	-0.82	1.47 × 10 ⁰⁹	0.321
830.887	427119	o	2.5	547472	e	1.5	0.05	1.07 × 10 ¹⁰	0.686
832.626	453000	o	3.5	573102	e	2.5	-1.62	2.31 × 10 ⁰⁸	0.103
832.672	427119	o	2.5	547214	e	2.5	-5.47	3.26 × 10 ⁰⁴	0.000
832.846	364827	e	2.5	484897	o	1.5	-3.78	1.59 × 10 ⁰⁶	0.001
833.599	482699	o	0.5	602661	e	0.5	-0.37	4.10 × 10 ⁰⁹	0.865
834.042	339683	e	1.5	459581	o	2.5	-1.20	6.16 × 10 ⁰⁸	0.191
836.366	427649	o	3.5	547214	e	2.5	-3.56	2.67 × 10 ⁰⁶	0.002
837.557	339683	e	1.5	459078	o	1.5	-0.83	1.42 × 10 ⁰⁹	0.218
838.205	325577	e	2.5	444879	o	1.5	-2.47	3.20 × 10 ⁰⁷	0.016
840.259	455878	o	1.5	574889	e	1.5	-0.56	2.62 × 10 ⁰⁹	0.344
841.740	440555	o	2.5	559356	e	1.5	0.07	1.11 × 10 ¹⁰	0.770
842.142	425678	o	0.5	544423	e	1.5	-1.83	1.38 × 10 ⁰⁸	0.010
843.051	455878	o	1.5	574495	e	2.5	-0.48	3.11 × 10 ⁰⁹	0.344
843.194	442454	o	1.5	561050	e	0.5	-0.66	2.07 × 10 ⁰⁹	0.368
843.544	427119	o	2.5	545666	e	2.5	-1.62	2.26 × 10 ⁰⁸	0.024
844.067	303517	e	3.5	421991	o	2.5	-2.08	7.77 × 10 ⁰⁷	0.042
844.748	346346	e	0.5	464724	o	0.5	-0.66	2.06 × 10 ⁰⁹	0.423
845.345	427119	o	2.5	545414	e	2.5	-1.69	1.93 × 10 ⁰⁸	0.031
846.447	319336	e	1.5	437477	o	1.5	-3.57	2.51 × 10 ⁰⁶	0.002
847.336	427649	o	3.5	545666	e	2.5	-1.59	2.40 × 10 ⁰⁸	0.057
849.153	427649	o	3.5	545414	e	2.5	0.20	1.46 × 10 ¹⁰	0.751
849.158	484897	o	1.5	602661	e	0.5	-0.42	3.51 × 10 ⁰⁹	0.785

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
850.212	425678	o	0.5	543296	e	0.5	-2.11	7.15×10^{07}	0.013
850.898	319336	e	1.5	436859	o	0.5	-2.09	7.45×10^{07}	0.043
851.622	455878	o	1.5	573301	e	1.5	-1.75	1.65×10^{08}	0.037
852.483	427119	o	2.5	544423	e	1.5	-0.98	9.53×10^{08}	0.133
853.070	455878	o	1.5	573102	e	2.5	-2.25	5.07×10^{07}	0.005
855.411	442454	o	1.5	559356	e	1.5	-1.24	5.22×10^{08}	0.089
855.602	325577	e	2.5	442454	o	1.5	-3.72	1.73×10^{06}	0.000
856.823	444340	o	0.5	561050	e	0.5	-0.47	3.07×10^{09}	0.737
860.619	339683	e	1.5	455878	o	1.5	-0.66	2.01×10^{09}	0.279
860.800	444879	o	1.5	561050	e	0.5	-0.36	3.97×10^{09}	0.741
861.389	319336	e	1.5	435428	o	1.5	-3.87	1.20×10^{06}	0.001
863.027	343710	e	2.5	459581	o	2.5	-1.22	5.28×10^{08}	0.103
863.472	459078	o	1.5	574889	e	1.5	-0.29	4.61×10^{09}	0.457
863.893	442454	o	1.5	558209	e	0.5	-0.37	3.78×10^{09}	0.717
866.089	319336	e	1.5	434798	o	0.5	-4.84	1.29×10^{05}	0.000
866.422	459078	o	1.5	574495	e	2.5	-0.56	2.43×10^{09}	0.661
866.791	343710	e	2.5	459078	o	1.5	-0.71	1.72×10^{09}	0.249
867.240	459581	o	2.5	574889	e	1.5	-0.63	2.07×10^{09}	0.614
868.164	369712	e	1.5	484897	o	1.5	-5.72	1.71×10^{04}	0.000
869.441	444340	o	0.5	559356	e	1.5	-1.53	2.61×10^{08}	0.129
869.731	325577	e	2.5	440555	o	2.5	-3.16	6.08×10^{06}	0.007
870.215	459581	o	2.5	574495	e	2.5	0.01	8.92×10^{09}	0.703
873.537	444879	o	1.5	559356	e	1.5	-0.66	1.91×10^{09}	0.368
875.477	459078	o	1.5	573301	e	1.5	-1.44	3.14×10^{08}	0.084
877.007	459078	o	1.5	573102	e	2.5	-2.44	3.13×10^{07}	0.009
877.133	434798	o	0.5	548806	e	1.5	-2.25	4.89×10^{07}	0.006
878.205	444340	o	0.5	558209	e	0.5	-2.14	6.24×10^{07}	0.060
879.350	459581	o	2.5	573301	e	1.5	-1.80	1.36×10^{08}	0.171
880.894	459581	o	2.5	573102	e	2.5	-1.41	3.33×10^{08}	0.110
882.006	435428	o	1.5	548806	e	1.5	-3.09	7.09×10^{06}	0.001
882.384	444879	o	1.5	558209	e	0.5	-1.44	3.11×10^{08}	0.098
882.653	421258	o	1.5	534553	e	1.5	-2.09	6.99×10^{07}	0.008
885.009	434798	o	0.5	547791	e	0.5	-2.38	3.54×10^{07}	0.005
885.053	369712	e	1.5	482699	o	0.5	-2.75	1.52×10^{07}	0.006
887.059	346346	e	0.5	459078	o	1.5	-1.24	4.99×10^{08}	0.210
887.515	434798	o	0.5	547472	e	1.5	-1.78	1.42×10^{08}	0.024
888.403	421991	o	2.5	534553	e	1.5	-2.36	3.69×10^{07}	0.024
889.055	421258	o	1.5	533737	e	2.5	-4.67	1.80×10^{05}	0.000
889.970	435428	o	1.5	547791	e	0.5	-3.50	2.69×10^{06}	0.001
891.515	343710	e	2.5	455878	o	1.5	-0.50	2.62×10^{09}	0.383
892.505	435428	o	1.5	547472	e	1.5	-0.27	4.50×10^{09}	0.445
893.284	436859	o	0.5	548806	e	1.5	-2.40	3.35×10^{07}	0.016
893.654	325577	e	2.5	437477	o	1.5	-3.10	6.74×10^{06}	0.003
894.564	435428	o	1.5	547214	e	2.5	-1.86	1.16×10^{08}	0.010
894.889	421991	o	2.5	533737	e	2.5	-2.24	4.83×10^{07}	0.007
898.242	437477	o	1.5	548806	e	1.5	-2.61	2.07×10^{07}	0.003
899.726	421258	o	1.5	532403	e	2.5	-1.21	5.01×10^{08}	0.017
901.454	436859	o	0.5	547791	e	0.5	-2.54	2.41×10^{07}	0.009
904.054	436859	o	0.5	547472	e	1.5	-1.13	6.12×10^{08}	0.176
905.701	421991	o	2.5	532403	e	2.5	-1.11	6.38×10^{08}	0.026
906.503	437477	o	1.5	547791	e	0.5	-3.74	1.49×10^{06}	0.000
907.125	435428	o	1.5	545666	e	2.5	-1.81	1.29×10^{08}	0.016
907.569	334695	e	0.5	444879	o	1.5	-3.88	1.07×10^{06}	0.003
907.729	464724	o	0.5	574889	e	1.5	-0.46	2.80×10^{09}	0.568
908.695	339683	e	1.5	449731	o	2.5	-1.61	1.99×10^{08}	0.205

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
909.133	437477	o	1.5	547472	e	1.5	-1.01	7.79 × 10 ⁰⁸	0.079
909.208	435428	o	1.5	545414	e	2.5	-1.15	5.72 × 10 ⁰⁸	0.139
910.325	325577	e	2.5	435428	o	1.5	-3.45	2.83 × 10 ⁰⁶	0.001
911.270	437477	o	1.5	547214	e	2.5	-1.63	1.88 × 10 ⁰⁸	0.018
912.033	334695	e	0.5	444340	o	0.5	-4.70	1.63 × 10 ⁰⁵	0.000
912.194	449731	o	2.5	559356	e	1.5	-3.72	1.53 × 10 ⁰⁶	0.001
912.199	434798	o	0.5	544423	e	1.5	-1.68	1.67 × 10 ⁰⁸	0.019
912.970	346346	e	0.5	455878	o	1.5	-5.40	3.22 × 10 ⁰⁴	0.000
914.994	343710	e	2.5	453000	o	3.5	-1.53	2.32 × 10 ⁰⁸	0.119
915.073	421258	o	1.5	530539	e	1.5	-2.21	4.88 × 10 ⁰⁷	0.002
917.471	435428	o	1.5	544423	e	1.5	-3.73	1.47 × 10 ⁰⁶	0.000
918.488	425678	o	0.5	534553	e	1.5	-1.34	3.65 × 10 ⁰⁸	0.025
921.005	464724	o	0.5	573301	e	1.5	-4.23	4.62 × 10 ⁰⁵	0.000
921.254	421991	o	2.5	530539	e	1.5	-1.50	2.48 × 10 ⁰⁸	0.027
921.675	434798	o	0.5	543296	e	0.5	-1.44	2.86 × 10 ⁰⁸	0.084
923.782	440555	o	2.5	548806	e	1.5	-2.56	2.19 × 10 ⁰⁷	0.022
924.308	437477	o	1.5	545666	e	2.5	-1.44	2.86 × 10 ⁰⁸	0.027
925.123	421258	o	1.5	529352	e	2.5	-1.31	3.82 × 10 ⁰⁸	0.015
926.320	421991	o	2.5	529945	e	3.5	-2.48	2.59 × 10 ⁰⁷	0.001
926.471	437477	o	1.5	545414	e	2.5	-1.37	3.33 × 10 ⁰⁸	0.148
927.058	435428	o	1.5	543296	e	0.5	-1.18	5.19 × 10 ⁰⁸	0.254
927.795	319336	e	1.5	427119	o	2.5	-3.15	5.54 × 10 ⁰⁶	0.017
927.999	334695	e	0.5	442454	o	1.5	-1.96	8.53 × 10 ⁰⁷	0.067
928.348	421258	o	1.5	528976	e	1.5	-2.25	4.33 × 10 ⁰⁷	0.005
929.680	436859	o	0.5	544423	e	1.5	-2.30	3.92 × 10 ⁰⁷	0.008
930.707	377452	e	0.5	484897	o	1.5	-5.43	2.87 × 10 ⁰⁴	0.000
930.803	427119	o	2.5	534553	e	1.5	-2.37	3.33 × 10 ⁰⁷	0.009
931.441	421991	o	2.5	529352	e	2.5	-1.23	4.57 × 10 ⁰⁸	0.022
933.711	421258	o	1.5	528358	e	0.5	-1.94	8.87 × 10 ⁰⁷	0.011
934.711	421991	o	2.5	528976	e	1.5	-1.96	8.30 × 10 ⁰⁷	0.030
935.051	437477	o	1.5	544423	e	1.5	-1.29	3.92 × 10 ⁰⁸	0.028
935.305	440555	o	2.5	547472	e	1.5	-2.21	4.74 × 10 ⁰⁷	0.006
937.567	440555	o	2.5	547214	e	2.5	-1.86	1.07 × 10 ⁰⁸	0.023
937.925	427119	o	2.5	533737	e	2.5	-1.77	1.30 × 10 ⁰⁸	0.008
938.474	358168	e	1.5	464724	o	0.5	-0.61	1.83 × 10 ⁰⁹	0.300
939.525	436859	o	0.5	543296	e	0.5	-3.06	6.67 × 10 ⁰⁶	0.005
940.275	442454	o	1.5	548806	e	1.5	-1.09	6.21 × 10 ⁰⁸	0.100
940.362	319336	e	1.5	425678	o	0.5	-3.89	9.69 × 10 ⁰⁵	0.001
942.615	427649	o	3.5	533737	e	2.5	-4.04	6.82 × 10 ⁰⁵	0.001
943.208	343710	e	2.5	449731	o	2.5	-1.47	2.53 × 10 ⁰⁸	0.157
945.011	437477	o	1.5	543296	e	0.5	-0.60	1.87 × 10 ⁰⁹	0.427
949.331	442454	o	1.5	547791	e	0.5	-3.03	6.91 × 10 ⁰⁶	0.001
949.810	427119	o	2.5	532403	e	2.5	-1.78	1.21 × 10 ⁰⁸	0.009
950.144	377452	e	0.5	482699	o	0.5	-4.36	3.22 × 10 ⁰⁵	0.000
950.601	339683	e	1.5	444879	o	1.5	-2.58	1.96 × 10 ⁰⁷	0.014
950.822	455878	o	1.5	561050	e	0.5	-1.46	2.55 × 10 ⁰⁸	0.220
951.288	379777	e	1.5	484897	o	1.5	-4.37	3.14 × 10 ⁰⁵	0.000
951.373	440555	o	2.5	545666	e	2.5	-1.31	3.67 × 10 ⁰⁸	0.073
952.215	442454	o	1.5	547472	e	1.5	-2.99	7.56 × 10 ⁰⁶	0.001
953.646	425678	o	0.5	530539	e	1.5	-1.45	2.58 × 10 ⁰⁸	0.015
953.665	440555	o	2.5	545414	e	2.5	-1.49	2.37 × 10 ⁰⁸	0.036
954.560	442454	o	1.5	547214	e	2.5	-2.02	6.97 × 10 ⁰⁷	0.010
954.620	427649	o	3.5	532403	e	2.5	-1.84	1.05 × 10 ⁰⁸	0.029
955.500	339683	e	1.5	444340	o	0.5	-0.95	8.28 × 10 ⁰⁸	0.188
957.254	444340	o	0.5	548806	e	1.5	-2.22	4.38 × 10 ⁰⁷	0.011

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
962.221	444879	o	1.5	548806	e	1.5	-1.07	6.25×10^{08}	0.146
962.759	440555	o	2.5	544423	e	1.5	-4.01	6.99×10^{05}	0.000
966.386	455878	o	1.5	559356	e	1.5	-1.01	7.01×10^{08}	0.353
966.642	444340	o	0.5	547791	e	0.5	-0.81	1.10×10^{09}	0.155
966.929	427119	o	2.5	530539	e	1.5	-3.77	1.20×10^{06}	0.000
968.073	425678	o	0.5	528976	e	1.5	-1.12	5.32×10^{08}	0.113
968.876	442454	o	1.5	545666	e	2.5	-1.25	3.98×10^{08}	0.036
969.633	444340	o	0.5	547472	e	1.5	-1.06	6.20×10^{08}	0.125
971.252	442454	o	1.5	545414	e	2.5	-1.46	2.46×10^{08}	0.049
971.604	379777	e	1.5	482699	o	0.5	-2.54	2.03×10^{07}	0.012
971.707	444879	o	1.5	547791	e	0.5	-6.46	2.45×10^{03}	0.000
972.511	427119	o	2.5	529945	e	3.5	-2.17	4.76×10^{07}	0.001
972.932	334695	e	0.5	437477	o	1.5	-1.74	1.28×10^{08}	0.108
973.038	339683	e	1.5	442454	o	1.5	-2.27	3.87×10^{07}	0.016
973.906	425678	o	0.5	528358	e	0.5	-2.21	4.36×10^{07}	0.004
974.137	319336	e	1.5	421991	o	2.5	-5.19	4.51×10^{04}	0.000
974.729	444879	o	1.5	547472	e	1.5	-1.38	2.92×10^{08}	0.061
977.187	444879	o	1.5	547214	e	2.5	-3.35	3.11×10^{06}	0.001
977.225	455878	o	1.5	558209	e	0.5	-2.39	2.86×10^{07}	0.039
977.554	427649	o	3.5	529945	e	3.5	-1.40	2.78×10^{08}	0.018
978.157	427119	o	2.5	529352	e	2.5	-2.68	1.44×10^{07}	0.001
978.817	334695	e	0.5	436859	o	0.5	-2.86	9.55×10^{06}	0.033
979.698	325577	e	2.5	427649	o	3.5	-3.42	2.62×10^{06}	0.012
980.655	459078	o	1.5	561050	e	0.5	-1.74	1.28×10^{08}	0.154
980.687	442454	o	1.5	544423	e	1.5	-1.19	4.50×10^{08}	0.035
981.145	319336	e	1.5	421258	o	1.5	-4.98	7.27×10^{04}	0.000
981.764	427119	o	2.5	528976	e	1.5	-2.49	2.22×10^{07}	0.015
983.259	427649	o	3.5	529352	e	2.5	-1.70	1.39×10^{08}	0.047
984.816	325577	e	2.5	427119	o	2.5	-3.90	8.65×10^{05}	0.001
986.070	358168	e	1.5	459581	o	2.5	-2.75	1.22×10^{07}	0.014
988.437	343710	e	2.5	444879	o	1.5	-1.16	4.66×10^{08}	0.334
990.986	358168	e	1.5	459078	o	1.5	-1.27	3.58×10^{08}	0.105
991.354	339683	e	1.5	440555	o	2.5	-2.13	5.10×10^{07}	0.097
991.649	442454	o	1.5	543296	e	0.5	-1.00	6.86×10^{08}	0.120
992.194	444879	o	1.5	545666	e	2.5	-2.02	6.45×10^{07}	0.017
992.280	421258	o	1.5	522036	e	2.5	-0.62	1.62×10^{09}	0.085
992.726	334695	e	0.5	435428	o	1.5	-5.54	1.92×10^{04}	0.000
994.687	444879	o	1.5	545414	e	2.5	-1.26	3.66×10^{08}	0.104
995.202	421258	o	1.5	521740	e	1.5	-2.19	4.33×10^{07}	0.004
997.219	459078	o	1.5	559356	e	1.5	-1.72	1.28×10^{08}	0.128
998.843	384781	e	0.5	484897	o	1.5	-2.47	2.28×10^{07}	0.009
998.973	334695	e	0.5	434798	o	0.5	-1.82	1.01×10^{08}	0.140
999.171	444340	o	0.5	544423	e	1.5	-1.31	3.26×10^{08}	0.053
999.552	421991	o	2.5	522036	e	2.5	-1.63	1.57×10^{08}	0.015
1002.248	459581	o	2.5	559356	e	1.5	-2.88	8.71×10^{06}	0.011
1002.456	434798	o	0.5	534553	e	1.5	-1.41	2.60×10^{08}	0.024
1002.518	421991	o	2.5	521740	e	1.5	-0.78	1.11×10^{09}	0.231
1004.584	444879	o	1.5	544423	e	1.5	-2.91	8.07×10^{06}	0.001
1008.765	459078	o	1.5	558209	e	0.5	-2.48	2.18×10^{07}	0.098
1008.826	435428	o	1.5	534553	e	1.5	-3.67	1.42×10^{06}	0.000
1009.338	449731	o	2.5	548806	e	1.5	-0.58	1.75×10^{09}	0.385
1010.552	444340	o	0.5	543296	e	0.5	-1.87	8.87×10^{07}	0.072
1012.719	343710	e	2.5	442454	o	1.5	-1.29	3.30×10^{08}	0.111
1014.880	346346	e	0.5	444879	o	1.5	-3.13	4.94×10^{06}	0.010
1016.090	444879	o	1.5	543296	e	0.5	-2.17	4.37×10^{07}	0.027

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1017.198	435428	o	1.5	533737	e	2.5	-1.06	5.62 × 10 ⁰⁸	0.019
1020.465	346346	e	0.5	444340	o	0.5	-1.28	3.48 × 10 ⁰⁸	0.157
1021.264	384781	e	0.5	482699	o	0.5	-1.98	6.64 × 10 ⁰⁷	0.018
1022.555	339683	e	1.5	437477	o	1.5	-1.96	7.09 × 10 ⁰⁷	0.026
1023.110	449731	o	2.5	547472	e	1.5	-1.96	7.06 × 10 ⁰⁷	0.021
1023.436	358168	e	1.5	455878	o	1.5	-2.68	1.33 × 10 ⁰⁷	0.005
1023.608	436859	o	0.5	534553	e	1.5	-5.10	5.11 × 10 ⁰⁴	0.000
1025.818	449731	o	2.5	547214	e	2.5	0.20	1.01 × 10 ¹⁰	0.571
1029.057	339683	e	1.5	436859	o	0.5	-1.55	1.80 × 10 ⁰⁸	0.214
1030.123	437477	o	1.5	534553	e	1.5	-0.61	1.54 × 10 ⁰⁹	0.136
1031.192	435428	o	1.5	532403	e	2.5	-1.06	5.47 × 10 ⁰⁸	0.019
1032.574	343710	e	2.5	440555	o	2.5	-1.28	3.19 × 10 ⁰⁸	0.265
1037.190	325577	e	2.5	421991	o	2.5	-4.54	1.78 × 10 ⁰⁵	0.000
1038.138	464724	o	0.5	561050	e	0.5	-1.19	3.98 × 10 ⁰⁸	0.206
1038.854	437477	o	1.5	533737	e	2.5	-0.29	3.19 × 10 ⁰⁹	0.182
1040.495	346346	e	0.5	442454	o	1.5	-2.69	1.29 × 10 ⁰⁷	0.015
1040.904	421991	o	2.5	518062	e	3.5	-0.28	3.25 × 10 ⁰⁹	0.287
1040.995	425678	o	0.5	521740	e	1.5	-0.06	5.40 × 10 ⁰⁹	0.441
1042.369	449731	o	2.5	545666	e	2.5	-1.09	5.01 × 10 ⁰⁸	0.052
1044.442	339683	e	1.5	435428	o	1.5	-1.52	1.86 × 10 ⁰⁸	0.107
1044.483	434798	o	0.5	530539	e	1.5	0.02	6.32 × 10 ⁰⁹	0.348
1045.120	449731	o	2.5	545414	e	2.5	-2.66	1.34 × 10 ⁰⁷	0.012
1045.138	325577	e	2.5	421258	o	1.5	-3.96	6.69 × 10 ⁰⁵	0.001
1050.580	421258	o	1.5	516443	e	0.5	-0.07	5.16 × 10 ⁰⁹	0.652
1051.359	339683	e	1.5	434798	o	0.5	-1.82	9.30 × 10 ⁰⁷	0.066
1051.401	435428	o	1.5	530539	e	1.5	-2.24	3.50 × 10 ⁰⁷	0.002
1052.494	369712	e	1.5	464724	o	0.5	-2.05	5.42 × 10 ⁰⁷	0.013
1053.454	437477	o	1.5	532403	e	2.5	-0.52	1.80 × 10 ⁰⁹	0.177
1053.548	427119	o	2.5	522036	e	2.5	0.12	7.87 × 10 ⁰⁹	0.529
1055.368	364827	e	2.5	459581	o	2.5	-1.93	6.98 × 10 ⁰⁷	0.011
1056.052	449731	o	2.5	544423	e	1.5	-1.41	2.31 × 10 ⁰⁸	0.108
1056.720	464724	o	0.5	559356	e	1.5	-2.08	4.93 × 10 ⁰⁷	0.149
1056.843	427119	o	2.5	521740	e	1.5	-0.99	6.18 × 10 ⁰⁸	0.160
1059.469	427649	o	3.5	522036	e	2.5	-1.67	1.27 × 10 ⁰⁸	0.093
1061.002	364827	e	2.5	459078	o	1.5	-2.70	1.18 × 10 ⁰⁷	0.008
1061.413	453000	o	3.5	547214	e	2.5	-0.67	1.28 × 10 ⁰⁹	0.479
1061.815	434798	o	0.5	528976	e	1.5	-0.73	1.09 × 10 ⁰⁹	0.100
1063.854	440555	o	2.5	534553	e	1.5	-2.58	1.58 × 10 ⁰⁷	0.009
1064.690	435428	o	1.5	529352	e	2.5	-0.21	3.65 × 10 ⁰⁹	0.152
1064.818	421258	o	1.5	515171	e	1.5	0.26	1.07 × 10 ¹⁰	0.623
1066.468	343710	e	2.5	437477	o	1.5	-1.15	4.14 × 10 ⁰⁸	0.100
1067.466	436859	o	0.5	530539	e	1.5	-1.19	3.78 × 10 ⁰⁸	0.030
1068.836	434798	o	0.5	528358	e	0.5	0.02	6.06 × 10 ⁰⁹	0.655
1068.965	435428	o	1.5	528976	e	1.5	-0.76	1.01 × 10 ⁰⁹	0.137
1069.694	464724	o	0.5	558209	e	0.5	-3.30	2.96 × 10 ⁰⁶	0.022
1072.877	421258	o	1.5	514465	e	2.5	0.17	8.49 × 10 ⁰⁹	0.309
1073.168	440555	o	2.5	533737	e	2.5	-0.71	1.14 × 10 ⁰⁹	0.150
1073.197	421991	o	2.5	515171	e	1.5	-0.17	3.91 × 10 ⁰⁹	0.604
1074.554	437477	o	1.5	530539	e	1.5	-0.11	4.51 × 10 ⁰⁹	0.396
1076.081	435428	o	1.5	528358	e	0.5	-5.06	5.04 × 10 ⁰⁴	0.000
1076.109	455878	o	1.5	548806	e	1.5	-1.26	3.19 × 10 ⁰⁸	0.032
1079.142	453000	o	3.5	545666	e	2.5	-0.92	7.02 × 10 ⁰⁸	0.120
1081.130	421991	o	2.5	514487	e	3.5	0.51	1.85 × 10 ¹⁰	0.441
1081.384	421991	o	2.5	514465	e	2.5	0.38	1.37 × 10 ¹⁰	0.622
1082.091	453000	o	3.5	545414	e	2.5	-2.17	3.88 × 10 ⁰⁷	0.010

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
1084.718	482699	o	0.5	574889	e	1.5	-1.42	2.15×10^8	0.314
1085.576	436859	o	0.5	528976	e	1.5	0.32	1.19×10^{10}	0.703
1085.787	442454	o	1.5	534553	e	1.5	-0.86	7.94×10^8	0.111
1087.987	455878	o	1.5	547791	e	0.5	-2.65	1.28×10^7	0.002
1088.439	437477	o	1.5	529352	e	2.5	0.29	1.09×10^{10}	0.547
1088.756	440555	o	2.5	532403	e	2.5	-0.08	4.71×10^9	0.427
1090.297	343710	e	2.5	435428	o	1.5	-1.27	2.95×10^8	0.124
1091.777	455878	o	1.5	547472	e	1.5	-3.15	3.95×10^6	0.001
1092.149	358168	e	1.5	449731	o	2.5	-1.73	1.03×10^8	0.098
1092.907	437477	o	1.5	528976	e	1.5	-1.12	4.23×10^8	0.058
1092.915	436859	o	0.5	528358	e	0.5	-1.10	4.50×10^8	0.076
1094.788	393555	e	2.5	484897	o	1.5	-1.62	1.33×10^8	0.141
1094.861	455878	o	1.5	547214	e	2.5	-3.09	4.58×10^6	0.000
1095.491	442454	o	1.5	533737	e	2.5	0.32	1.16×10^{10}	0.568
1097.316	346346	e	0.5	437477	o	1.5	-2.42	2.16×10^7	0.029
1098.285	364827	e	2.5	455878	o	1.5	-2.41	2.15×10^7	0.004
1099.104	334695	e	0.5	425678	o	0.5	-1.78	9.22×10^7	0.124
1099.591	427119	o	2.5	518062	e	3.5	0.71	2.83×10^{10}	0.768
1100.346	437477	o	1.5	528358	e	0.5	-0.86	7.58×10^8	0.239
1101.742	425678	o	0.5	516443	e	0.5	-0.33	2.54×10^9	0.360
1102.514	394195	e	1.5	484897	o	1.5	-2.36	2.41×10^7	0.056
1103.730	482699	o	0.5	573301	e	1.5	0.37	1.28×10^{10}	0.750
1104.807	346346	e	0.5	436859	o	0.5	-2.07	4.75×10^7	0.112
1106.042	427649	o	3.5	518062	e	3.5	-1.00	5.47×10^8	0.195
1108.491	444340	o	0.5	534553	e	1.5	0.29	1.05×10^{10}	0.713
1111.211	484897	o	1.5	574889	e	1.5	-2.10	4.28×10^7	0.164
1111.308	440555	o	2.5	530539	e	1.5	-1.01	5.30×10^8	0.109
1111.739	442454	o	1.5	532403	e	2.5	-0.89	6.97×10^8	0.031
1112.729	369712	e	1.5	459581	o	2.5	-3.00	5.41×10^6	0.001
1113.736	455878	o	1.5	545666	e	2.5	0.27	1.01×10^{10}	0.585
1114.481	459078	o	1.5	548806	e	1.5	0.13	7.29×10^9	0.549
1115.157	444879	o	1.5	534553	e	1.5	-0.73	1.00×10^9	0.226
1116.101	484897	o	1.5	574495	e	2.5	-2.50	1.68×10^7	0.041
1116.877	455878	o	1.5	545414	e	2.5	-1.43	1.96×10^8	0.092
1117.411	425678	o	0.5	515171	e	1.5	-0.57	1.42×10^9	0.142
1118.689	440555	o	2.5	529945	e	3.5	0.75	2.98×10^{10}	0.744
1118.994	369712	e	1.5	459078	o	1.5	-2.14	3.88×10^7	0.005
1120.765	459581	o	2.5	548806	e	1.5	-1.45	1.92×10^8	0.071
1122.560	346346	e	0.5	435428	o	1.5	-2.62	1.30×10^7	0.025
1125.396	444879	o	1.5	533737	e	2.5	-0.11	4.04×10^9	0.237
1126.166	440555	o	2.5	529352	e	2.5	-0.73	9.84×10^8	0.078
1127.226	459078	o	1.5	547791	e	0.5	-0.42	2.01×10^9	0.389
1129.371	455878	o	1.5	544423	e	1.5	0.17	7.74×10^9	0.477
1129.895	394195	e	1.5	482699	o	0.5	-3.00	5.27×10^6	0.010
1130.554	346346	e	0.5	434798	o	0.5	-2.74	9.69×10^6	0.012
1130.950	440555	o	2.5	528976	e	1.5	-2.93	6.18×10^6	0.003
1131.172	484897	o	1.5	573301	e	1.5	-0.61	1.27×10^9	0.425
1131.295	459078	o	1.5	547472	e	1.5	-2.48	1.74×10^7	0.004
1133.728	484897	o	1.5	573102	e	2.5	0.32	1.06×10^{10}	0.726
1134.137	364827	e	2.5	453000	o	3.5	-2.12	3.97×10^7	0.004
1134.606	459078	o	1.5	547214	e	2.5	0.32	1.08×10^{10}	0.517
1135.264	442454	o	1.5	530539	e	1.5	-0.88	6.75×10^8	0.059
1135.692	427119	o	2.5	515171	e	1.5	-2.19	3.30×10^7	0.011
1137.771	459581	o	2.5	547472	e	1.5	-1.35	2.31×10^8	0.101
1141.120	459581	o	2.5	547214	e	2.5	-0.28	2.69×10^9	0.243

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1142.550	444879	o	1.5	532403	e	2.5	0.43	1.36 × 10 ¹⁰	0.603
1143.695	339683	e	1.5	427119	o	2.5	-2.27	2.77 × 10 ⁰⁷	0.040
1143.933	455878	o	1.5	543296	e	0.5	-0.23	3.00 × 10 ⁰⁹	0.401
1144.579	427119	o	2.5	514487	e	3.5	-0.27	2.72 × 10 ⁰⁹	0.180
1144.863	427119	o	2.5	514465	e	2.5	-2.61	1.25 × 10 ⁰⁷	0.001
1145.843	377452	e	0.5	464724	o	0.5	-5.20	3.20 × 10 ⁰⁴	0.000
1150.188	434798	o	0.5	521740	e	1.5	-1.63	1.20 × 10 ⁰⁸	0.014
1150.774	442454	o	1.5	529352	e	2.5	0.13	6.67 × 10 ⁰⁹	0.529
1151.571	427649	o	3.5	514487	e	3.5	0.27	9.30 × 10 ⁰⁹	0.674
1151.859	427649	o	3.5	514465	e	2.5	-0.50	1.60 × 10 ⁰⁹	0.532
1153.253	358168	e	1.5	444879	o	1.5	-1.55	1.41 × 10 ⁰⁸	0.119
1154.624	435428	o	1.5	522036	e	2.5	0.35	1.13 × 10 ¹⁰	0.450
1154.889	459078	o	1.5	545666	e	2.5	-0.50	1.58 × 10 ⁰⁹	0.132
1155.227	334695	e	0.5	421258	o	1.5	-2.10	4.03 × 10 ⁰⁷	0.086
1155.769	442454	o	1.5	528976	e	1.5	-0.61	1.23 × 10 ⁰⁹	0.396
1158.267	459078	o	1.5	545414	e	2.5	-1.72	9.53 × 10 ⁰⁷	0.102
1158.582	435428	o	1.5	521740	e	1.5	0.04	5.56 × 10 ⁰⁹	0.553
1160.108	444340	o	0.5	530539	e	1.5	-2.98	5.16 × 10 ⁰⁶	0.001
1160.470	358168	e	1.5	444340	o	0.5	-1.44	1.80 × 10 ⁰⁸	0.118
1160.544	369712	e	1.5	455878	o	1.5	-0.93	5.84 × 10 ⁰⁸	0.090
1161.639	459581	o	2.5	545666	e	2.5	0.20	7.90 × 10 ⁰⁹	0.398
1162.853	339683	e	1.5	425678	o	0.5	-1.82	7.70 × 10 ⁰⁷	0.050
1164.092	442454	o	1.5	528358	e	0.5	-1.45	1.73 × 10 ⁰⁸	0.056
1165.056	459581	o	2.5	545414	e	2.5	-1.35	2.20 × 10 ⁰⁸	0.089
1167.412	444879	o	1.5	530539	e	1.5	-0.29	2.52 × 10 ⁰⁹	0.290
1171.710	459078	o	1.5	544423	e	1.5	-0.71	9.40 × 10 ⁰⁸	0.125
1177.199	379777	e	1.5	464724	o	0.5	-1.88	6.40 × 10 ⁰⁷	0.045
1177.806	364827	e	2.5	449731	o	2.5	-3.44	1.75 × 10 ⁰⁶	0.001
1178.121	436859	o	0.5	521740	e	1.5	-1.55	1.36 × 10 ⁰⁸	0.036
1178.658	459581	o	2.5	544423	e	1.5	-0.25	2.73 × 10 ⁰⁹	0.460
1178.939	449731	o	2.5	534553	e	1.5	-4.51	1.48 × 10 ⁰⁵	0.000
1181.529	444340	o	0.5	528976	e	1.5	-1.88	6.24 × 10 ⁰⁷	0.016
1182.607	437477	o	1.5	522036	e	2.5	-0.99	4.90 × 10 ⁰⁸	0.034
1183.819	444879	o	1.5	529352	e	2.5	-1.18	3.09 × 10 ⁰⁸	0.043
1186.443	358168	e	1.5	442454	o	1.5	-1.92	5.65 × 10 ⁰⁷	0.040
1186.760	437477	o	1.5	521740	e	1.5	-0.79	7.70 × 10 ⁰⁸	0.117
1187.392	459078	o	1.5	543296	e	0.5	-0.67	1.03 × 10 ⁰⁹	0.508
1189.106	444879	o	1.5	528976	e	1.5	-1.89	6.02 × 10 ⁰⁷	0.040
1189.322	464724	o	0.5	548806	e	1.5	-0.01	4.65 × 10 ⁰⁹	0.557
1190.229	444340	o	0.5	528358	e	0.5	-1.20	2.96 × 10 ⁰⁸	0.074
1190.388	449731	o	2.5	533737	e	2.5	-1.70	9.46 × 10 ⁰⁷	0.037
1191.333	343710	e	2.5	427649	o	3.5	-2.35	2.05 × 10 ⁰⁷	0.157
1197.918	444879	o	1.5	528358	e	0.5	-1.25	2.64 × 10 ⁰⁸	0.137
1198.910	343710	e	2.5	427119	o	2.5	-1.07	3.90 × 10 ⁰⁸	0.250
1203.848	464724	o	0.5	547791	e	0.5	-0.06	4.00 × 10 ⁰⁹	0.625
1208.490	464724	o	0.5	547472	e	1.5	-2.37	1.97 × 10 ⁰⁷	0.010
1209.597	449731	o	2.5	532403	e	2.5	-4.89	5.81 × 10 ⁰⁴	0.000
1213.787	358168	e	1.5	440555	o	2.5	-3.14	3.22 × 10 ⁰⁶	0.020
1214.943	339683	e	1.5	421991	o	2.5	-3.38	1.92 × 10 ⁰⁶	0.013
1224.804	434798	o	0.5	516443	e	0.5	-1.86	6.22 × 10 ⁰⁷	0.010
1225.106	377452	e	0.5	459078	o	1.5	-2.42	1.69 × 10 ⁰⁷	0.058
1225.863	339683	e	1.5	421258	o	1.5	-3.55	1.28 × 10 ⁰⁶	0.002
1227.278	440555	o	2.5	522036	e	2.5	-3.32	2.12 × 10 ⁰⁶	0.000
1231.752	440555	o	2.5	521740	e	1.5	-2.69	8.97 × 10 ⁰⁶	0.004
1234.327	435428	o	1.5	516443	e	0.5	-3.10	3.55 × 10 ⁰⁶	0.001

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
1237.498	449731	o	2.5	530539	e	1.5	-2.28	2.28×10^{07}	0.024
1238.588	453000	o	3.5	533737	e	2.5	-2.79	7.07×10^{06}	0.014
1244.199	434798	o	0.5	515171	e	1.5	-2.82	6.46×10^{06}	0.001
1246.657	449731	o	2.5	529945	e	3.5	-3.39	1.74×10^{06}	0.001
1249.184	364827	e	2.5	444879	o	1.5	-0.85	6.04×10^{08}	0.099
1249.702	369712	e	1.5	449731	o	2.5	-3.01	4.19×10^{06}	0.001
1250.897	384781	e	0.5	464724	o	0.5	-0.80	6.72×10^{08}	0.277
1253.068	379777	e	1.5	459581	o	2.5	-2.67	9.04×10^{06}	0.005
1254.028	435428	o	1.5	515171	e	1.5	-2.83	6.31×10^{06}	0.001
1254.722	464724	o	0.5	544423	e	1.5	-0.59	1.09×10^{09}	0.280
1255.950	449731	o	2.5	529352	e	2.5	-4.09	3.39×10^{05}	0.001
1256.528	436859	o	0.5	516443	e	0.5	-1.44	1.53×10^{08}	0.040
1256.560	442454	o	1.5	522036	e	2.5	-0.93	4.96×10^{08}	0.034
1259.398	453000	o	3.5	532403	e	2.5	-4.25	2.39×10^{05}	0.001
1260.516	346346	e	0.5	425678	o	0.5	-2.77	7.38×10^{06}	0.008
1260.892	358168	e	1.5	437477	o	1.5	-2.33	1.96×10^{07}	0.020
1261.018	379777	e	1.5	459078	o	1.5	-1.64	9.59×10^{07}	0.034
1261.250	442454	o	1.5	521740	e	1.5	-0.88	5.58×10^{08}	0.068
1261.903	449731	o	2.5	528976	e	1.5	-3.67	8.99×10^{05}	0.005
1265.220	435428	o	1.5	514465	e	2.5	-1.30	2.08×10^{08}	0.018
1266.360	437477	o	1.5	516443	e	0.5	-1.60	1.04×10^{08}	0.045
1270.793	358168	e	1.5	436859	o	0.5	-3.57	1.10×10^{06}	0.003
1271.058	455878	o	1.5	534553	e	1.5	-1.60	1.05×10^{08}	0.022
1272.721	464724	o	0.5	543296	e	0.5	-1.12	3.11×10^{08}	0.101
1275.086	377452	e	0.5	455878	o	1.5	-2.49	1.33×10^{07}	0.013
1276.307	482699	o	0.5	561050	e	0.5	-2.01	4.06×10^{07}	0.070
1276.950	436859	o	0.5	515171	e	1.5	-1.98	4.31×10^{07}	0.007
1277.439	343710	e	2.5	421991	o	2.5	-3.03	3.71×10^{06}	0.013
1284.376	455878	o	1.5	533737	e	2.5	-0.53	1.18×10^{09}	0.249
1287.105	437477	o	1.5	515171	e	1.5	-1.47	1.36×10^{08}	0.026
1288.219	364827	e	2.5	442454	o	1.5	-1.05	3.58×10^{08}	0.053
1289.517	343710	e	2.5	421258	o	1.5	-2.36	1.73×10^{07}	0.018
1290.212	440555	o	2.5	518062	e	3.5	-2.21	2.49×10^{07}	0.001
1291.990	444340	o	0.5	521740	e	1.5	-2.79	6.53×10^{06}	0.001
1294.338	358168	e	1.5	435428	o	1.5	-1.63	9.20×10^{07}	0.083
1296.065	444879	o	1.5	522036	e	2.5	-1.27	2.12×10^{08}	0.017
1298.899	437477	o	1.5	514465	e	2.5	-4.46	1.38×10^{05}	0.000
1299.624	453000	o	3.5	529945	e	3.5	-2.68	8.17×10^{06}	0.006
1301.055	444879	o	1.5	521740	e	1.5	-0.79	6.35×10^{08}	0.090
1304.509	482699	o	0.5	559356	e	1.5	-2.65	8.78×10^{06}	0.043
1304.978	358168	e	1.5	434798	o	0.5	-2.24	2.25×10^{07}	0.021
1306.768	455878	o	1.5	532403	e	2.5	-1.13	2.90×10^{08}	0.129
1309.726	453000	o	3.5	529352	e	2.5	-2.78	6.47×10^{06}	0.017
1313.145	484897	o	1.5	561050	e	0.5	-2.90	4.90×10^{06}	0.014
1314.034	379777	e	1.5	455878	o	1.5	-0.51	1.21×10^{09}	0.393
1320.520	364827	e	2.5	440555	o	2.5	-1.30	1.91×10^{08}	0.023
1324.338	482699	o	0.5	558209	e	0.5	-4.56	1.04×10^{05}	0.000
1324.940	459078	o	1.5	534553	e	1.5	-0.98	4.06×10^{08}	0.109
1330.359	369712	e	1.5	444879	o	1.5	-0.77	6.40×10^{08}	0.117
1333.831	459581	o	2.5	534553	e	1.5	-1.45	1.34×10^{08}	0.136
1334.892	346346	e	0.5	421258	o	1.5	-3.66	8.47×10^{05}	0.004
1339.392	455878	o	1.5	530539	e	1.5	-0.96	4.08×10^{08}	0.123
1339.418	459078	o	1.5	533737	e	2.5	-0.88	4.91×10^{08}	0.117
1339.972	369712	e	1.5	444340	o	0.5	-1.28	1.96×10^{08}	0.049
1340.198	440555	o	2.5	515171	e	1.5	-1.58	9.78×10^{07}	0.034

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1343.017	484897	o	1.5	559356	e	1.5	-4.25	2.10 × 10 ⁰⁵	0.001
1345.964	384781	e	0.5	459078	o	1.5	-1.26	2.03 × 10 ⁰⁸	0.344
1348.505	459581	o	2.5	533737	e	2.5	-1.08	3.06 × 10 ⁰⁸	0.193
1351.537	442454	o	1.5	516443	e	0.5	-1.60	9.21 × 10 ⁰⁷	0.034
1352.592	440555	o	2.5	514487	e	3.5	-3.66	7.95 × 10 ⁰⁵	0.000
1352.989	440555	o	2.5	514465	e	2.5	-1.30	1.84 × 10 ⁰⁸	0.021
1361.034	455878	o	1.5	529352	e	2.5	-2.95	3.99 × 10 ⁰⁶	0.002
1363.787	459078	o	1.5	532403	e	2.5	-2.08	2.95 × 10 ⁰⁷	0.040
1364.043	484897	o	1.5	558209	e	0.5	-3.61	8.80 × 10 ⁰⁵	0.002
1368.027	455878	o	1.5	528976	e	1.5	-3.20	2.25 × 10 ⁰⁶	0.003
1373.210	459581	o	2.5	532403	e	2.5	-1.59	9.03 × 10 ⁰⁷	0.095
1374.721	369712	e	1.5	442454	o	1.5	-1.41	1.39 × 10 ⁰⁸	0.025
1375.193	442454	o	1.5	515171	e	1.5	-1.97	3.78 × 10 ⁰⁷	0.007
1376.464	364827	e	2.5	437477	o	1.5	-1.17	2.37 × 10 ⁰⁸	0.144
1379.703	455878	o	1.5	528358	e	0.5	-1.71	6.85 × 10 ⁰⁷	0.063
1383.025	449731	o	2.5	522036	e	2.5	-3.40	1.40 × 10 ⁰⁶	0.001
1386.897	444340	o	0.5	516443	e	0.5	-1.70	6.82 × 10 ⁰⁷	0.036
1388.664	442454	o	1.5	514465	e	2.5	-2.75	6.12 × 10 ⁰⁶	0.001
1388.709	449731	o	2.5	521740	e	1.5	-3.11	2.71 × 10 ⁰⁶	0.003
1397.348	444879	o	1.5	516443	e	0.5	-1.86	4.76 × 10 ⁰⁷	0.027
1399.359	459078	o	1.5	530539	e	1.5	-2.21	2.10 × 10 ⁰⁷	0.009
1406.535	384781	e	0.5	455878	o	1.5	-1.25	1.91 × 10 ⁰⁸	0.315
1409.282	459581	o	2.5	530539	e	1.5	-1.55	9.39 × 10 ⁰⁷	0.125
1411.567	369712	e	1.5	440555	o	2.5	-1.45	1.19 × 10 ⁰⁸	0.012
1411.818	444340	o	0.5	515171	e	1.5	-1.84	4.79 × 10 ⁰⁷	0.025
1416.419	364827	e	2.5	435428	o	1.5	-0.97	3.52 × 10 ⁰⁸	0.112
1417.865	394195	e	1.5	464724	o	0.5	-0.28	1.76 × 10 ⁰⁹	0.445
1421.172	459581	o	2.5	529945	e	3.5	-3.10	2.60 × 10 ⁰⁶	0.001
1422.649	444879	o	1.5	515171	e	1.5	-1.84	4.79 × 10 ⁰⁷	0.014
1423.000	459078	o	1.5	529352	e	2.5	-2.95	3.64 × 10 ⁰⁶	0.005
1429.509	379777	e	1.5	449731	o	2.5	-2.58	8.58 × 10 ⁰⁶	0.004
1430.646	459078	o	1.5	528976	e	1.5	-2.01	3.20 × 10 ⁰⁷	0.085
1432.075	464724	o	0.5	534553	e	1.5	-1.23	1.94 × 10 ⁰⁸	0.056
1433.261	459581	o	2.5	529352	e	2.5	-1.89	4.17 × 10 ⁰⁷	0.081
1437.071	444879	o	1.5	514465	e	2.5	-2.29	1.64 × 10 ⁰⁷	0.005
1441.019	459581	o	2.5	528976	e	1.5	-2.67	6.82 × 10 ⁰⁶	0.047
1443.421	459078	o	1.5	528358	e	0.5	-2.28	1.69 × 10 ⁰⁷	0.022
1448.517	453000	o	3.5	522036	e	2.5	-4.54	9.25 × 10 ⁰⁴	0.000
1450.315	358168	e	1.5	427119	o	2.5	-4.13	2.34 × 10 ⁰⁵	0.001
1463.468	449731	o	2.5	518062	e	3.5	-3.29	1.60 × 10 ⁰⁶	0.000
1475.680	369712	e	1.5	437477	o	1.5	-1.81	4.82 × 10 ⁰⁷	0.008
1481.260	358168	e	1.5	425678	o	0.5	-2.45	1.07 × 10 ⁰⁷	0.012
1483.079	377452	e	0.5	444879	o	1.5	-0.91	3.73 × 10 ⁰⁸	0.179
1489.260	369712	e	1.5	436859	o	0.5	-1.15	2.12 × 10 ⁰⁸	0.106
1495.036	377452	e	0.5	444340	o	0.5	-1.39	1.22 × 10 ⁰⁸	0.231
1511.537	455878	o	1.5	522036	e	2.5	-1.12	2.21 × 10 ⁰⁸	0.068
1512.716	482699	o	0.5	548806	e	1.5	-2.15	2.09 × 10 ⁰⁷	0.046
1514.568	393555	e	2.5	459581	o	2.5	0.21	4.72 × 10 ⁰⁹	0.473
1518.329	455878	o	1.5	521740	e	1.5	-1.22	1.75 × 10 ⁰⁸	0.050
1519.414	464724	o	0.5	530539	e	1.5	-1.45	1.03 × 10 ⁰⁸	0.055
1521.699	369712	e	1.5	435428	o	1.5	-0.10	2.28 × 10 ⁰⁹	0.381
1526.198	393555	e	2.5	459078	o	1.5	-0.42	1.10 × 10 ⁰⁹	0.491
1528.117	449731	o	2.5	515171	e	1.5	-4.10	2.27 × 10 ⁰⁵	0.001
1529.396	394195	e	1.5	459581	o	2.5	-0.37	1.21 × 10 ⁰⁹	0.528
1536.035	379777	e	1.5	444879	o	1.5	-0.53	8.39 × 10 ⁰⁸	0.222

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
1536.294	482699	o	0.5	547791	e	0.5	-3.61	7.00×10^{05}	0.002
1536.426	369712	e	1.5	434798	o	0.5	-2.82	4.29×10^{06}	0.001
1537.003	453000	o	3.5	518062	e	3.5	-3.85	4.01×10^{05}	0.001
1538.423	377452	e	0.5	442454	o	1.5	-0.24	1.61×10^{09}	0.524
1541.255	394195	e	1.5	459078	o	1.5	-0.06	2.47×10^{09}	0.382
1543.862	482699	o	0.5	547472	e	1.5	-2.42	1.05×10^{07}	0.033
1544.252	449731	o	2.5	514487	e	3.5	-2.70	5.64×10^{06}	0.006
1544.769	449731	o	2.5	514465	e	2.5	-3.23	1.64×10^{06}	0.002
1548.865	379777	e	1.5	444340	o	0.5	-1.27	1.53×10^{08}	0.077
1556.370	464724	o	0.5	528976	e	1.5	-4.27	1.45×10^{05}	0.001
1564.742	484897	o	1.5	548806	e	1.5	-1.80	4.36×10^{07}	0.049
1566.831	358168	e	1.5	421991	o	2.5	-4.34	1.24×10^{05}	0.003
1571.500	464724	o	0.5	528358	e	0.5	-4.03	2.54×10^{05}	0.000
1585.041	358168	e	1.5	421258	o	1.5	-2.98	2.76×10^{06}	0.011
1588.352	459078	o	1.5	522036	e	2.5	-1.69	5.48×10^{07}	0.019
1589.983	484897	o	1.5	547791	e	0.5	-2.40	1.07×10^{07}	0.010
1591.799	364827	e	2.5	427649	o	3.5	0.41	6.71×10^{09}	0.616
1595.481	379777	e	1.5	442454	o	1.5	-1.20	1.64×10^{08}	0.045
1595.853	459078	o	1.5	521740	e	1.5	-2.71	5.16×10^{06}	0.002
1598.091	484897	o	1.5	547472	e	1.5	-2.55	7.37×10^{06}	0.027
1601.147	459581	o	2.5	522036	e	2.5	-1.57	7.00×10^{07}	0.064
1604.549	393555	e	2.5	455878	o	1.5	-0.36	1.14×10^{09}	0.213
1604.707	484897	o	1.5	547214	e	2.5	-2.29	1.34×10^{07}	0.023
1605.354	364827	e	2.5	427119	o	2.5	-1.62	6.22×10^{07}	0.023
1608.770	459581	o	2.5	521740	e	1.5	-3.19	1.67×10^{06}	0.002
1620.123	482699	o	0.5	544423	e	1.5	-2.36	1.11×10^{07}	0.018
1621.200	394195	e	1.5	455878	o	1.5	-0.41	9.90×10^{08}	0.278
1621.434	423223	e	0.5	484897	o	1.5	-0.21	1.59×10^{09}	0.589
1626.356	453000	o	3.5	514487	e	3.5	-1.94	2.89×10^{07}	0.019
1626.931	453000	o	3.5	514465	e	2.5	-3.81	3.92×10^{05}	0.001
1645.326	379777	e	1.5	440555	o	2.5	0.25	4.38×10^{09}	0.595
1645.581	484897	o	1.5	545666	e	2.5	-2.31	1.21×10^{07}	0.013
1650.259	482699	o	0.5	543296	e	0.5	-5.24	1.43×10^{04}	0.000
1651.110	455878	o	1.5	516443	e	0.5	-2.44	8.84×10^{06}	0.011
1652.448	484897	o	1.5	545414	e	2.5	-5.42	9.36×10^{03}	0.000
1663.952	384781	e	0.5	444879	o	1.5	-0.22	1.46×10^{09}	0.575
1665.974	377452	e	0.5	437477	o	1.5	-0.58	6.28×10^{08}	0.324
1679.018	384781	e	0.5	444340	o	0.5	-0.37	1.02×10^{09}	0.531
1679.946	484897	o	1.5	544423	e	1.5	-1.39	9.64×10^{07}	0.103
1681.356	423223	e	0.5	482699	o	0.5	-0.22	1.44×10^{09}	0.614
1682.241	393555	e	2.5	453000	o	3.5	0.38	5.65×10^{09}	0.595
1683.302	377452	e	0.5	436859	o	0.5	-0.30	1.17×10^{09}	0.587
1686.552	455878	o	1.5	515171	e	1.5	-2.18	1.55×10^{07}	0.010
1706.859	455878	o	1.5	514465	e	2.5	-2.12	1.74×10^{07}	0.013
1709.964	459581	o	2.5	518062	e	3.5	-3.92	2.74×10^{05}	0.000
1712.370	484897	o	1.5	543296	e	0.5	-2.28	1.19×10^{07}	0.026
1724.862	377452	e	0.5	435428	o	1.5	-0.64	5.13×10^{08}	0.217
1733.091	379777	e	1.5	437477	o	1.5	-0.22	1.35×10^{09}	0.389
1733.937	384781	e	0.5	442454	o	1.5	-0.39	9.12×10^{08}	0.414
1741.948	369712	e	1.5	427119	o	2.5	0.24	3.81×10^{09}	0.603
1743.198	459078	o	1.5	516443	e	0.5	-2.20	1.39×10^{07}	0.029
1743.810	377452	e	0.5	434798	o	0.5	-1.53	6.45×10^{07}	0.055
1749.350	364827	e	2.5	421991	o	2.5	0.22	3.60×10^{09}	0.545
1751.852	379777	e	1.5	436859	o	0.5	-1.39	8.80×10^{07}	0.066
1753.893	464724	o	0.5	521740	e	1.5	-1.73	4.07×10^{07}	0.020

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1772.080	364827	e	2.5	421258	o	1.5	-0.07	1.81×10^{09}	0.515
1780.139	393555	e	2.5	449731	o	2.5	-0.43	7.83×10^{08}	0.582
1782.751	459078	o	1.5	515171	e	1.5	-3.12	1.61×10^{06}	0.002
1786.783	369712	e	1.5	425678	o	0.5	-0.32	1.02×10^{09}	0.509
1796.912	379777	e	1.5	435428	o	1.5	-4.60	5.15×10^{04}	0.000
1798.886	459581	o	2.5	515171	e	1.5	-2.40	8.21×10^{06}	0.019
1800.658	394195	e	1.5	449731	o	2.5	0.12	2.73×10^{09}	0.469
1805.456	459078	o	1.5	514465	e	2.5	-3.75	3.67×10^{05}	0.000
1817.484	379777	e	1.5	434798	o	0.5	-0.33	9.38×10^{08}	0.528
1821.287	459581	o	2.5	514487	e	3.5	-2.81	3.09×10^{06}	0.002
1822.007	459581	o	2.5	514465	e	2.5	-2.06	1.75×10^{07}	0.017
1897.693	384781	e	0.5	437477	o	1.5	-1.75	3.29×10^{07}	0.050
1912.794	369712	e	1.5	421991	o	2.5	-1.79	2.97×10^{07}	0.012
1920.209	384781	e	0.5	436859	o	0.5	-2.18	1.20×10^{07}	0.033
1928.510	482699	o	0.5	534553	e	1.5	-2.39	7.33×10^{06}	0.007
1933.509	464724	o	0.5	516443	e	0.5	-6.11	1.39×10^{03}	0.000
1940.003	369712	e	1.5	421258	o	1.5	-0.73	3.29×10^{08}	0.191
1948.406	393555	e	2.5	444879	o	1.5	-2.38	7.35×10^{06}	0.025
1973.014	394195	e	1.5	444879	o	1.5	-2.01	1.69×10^{07}	0.047
1974.480	384781	e	0.5	435428	o	1.5	-1.07	1.42×10^{08}	0.106
1982.291	464724	o	0.5	515171	e	1.5	-2.35	7.51×10^{06}	0.016
1994.233	394195	e	1.5	444340	o	0.5	-1.17	1.16×10^{08}	0.216
1999.347	384781	e	0.5	434798	o	0.5	-1.59	4.28×10^{07}	0.081
2013.224	484897	o	1.5	534553	e	1.5	-1.98	1.73×10^{07}	0.041
2044.404	393555	e	2.5	442454	o	1.5	-1.02	1.53×10^{08}	0.159
2046.859	484897	o	1.5	533737	e	2.5	-5.34	7.23×10^{03}	0.000
2071.526	394195	e	1.5	442454	o	1.5	-3.66	3.42×10^{05}	0.001
2072.904	377452	e	0.5	425678	o	0.5	-1.52	4.73×10^{07}	0.211
2089.653	482699	o	0.5	530539	e	1.5	-4.27	8.21×10^{04}	0.000
2104.347	484897	o	1.5	532403	e	2.5	-2.61	3.66×10^{06}	0.010
2111.620	379777	e	1.5	427119	o	2.5	-1.61	3.70×10^{07}	0.012
2127.008	393555	e	2.5	440555	o	2.5	-2.53	4.35×10^{06}	0.011
2156.381	394195	e	1.5	440555	o	2.5	-3.20	9.06×10^{05}	0.002
2160.229	482699	o	0.5	528976	e	1.5	-3.65	3.20×10^{05}	0.000
2177.895	379777	e	1.5	425678	o	0.5	-2.37	6.12×10^{06}	0.006
2189.500	482699	o	0.5	528358	e	0.5	-2.57	3.73×10^{06}	0.021
2190.296	484897	o	1.5	530539	e	1.5	-2.49	4.44×10^{06}	0.012
2248.796	484897	o	1.5	529352	e	2.5	-2.91	1.61×10^{06}	0.002
2267.959	484897	o	1.5	528976	e	1.5	-3.03	1.21×10^{06}	0.006
2276.077	393555	e	2.5	437477	o	1.5	-0.81	2.00×10^{08}	0.435
2282.093	377452	e	0.5	421258	o	1.5	-1.32	6.17×10^{07}	0.045
2300.244	484897	o	1.5	528358	e	0.5	-2.09	1.03×10^{07}	0.053
2309.743	394195	e	1.5	437477	o	1.5	-1.69	2.55×10^{07}	0.059
2343.198	394195	e	1.5	436859	o	0.5	-4.27	6.52×10^{04}	0.001
2368.129	379777	e	1.5	421991	o	2.5	-1.60	3.01×10^{07}	0.018
2387.483	393555	e	2.5	435428	o	1.5	-1.52	3.46×10^{07}	0.219
2408.872	423223	e	0.5	464724	o	0.5	-3.24	6.64×10^{05}	0.006
2409.991	379777	e	1.5	421258	o	1.5	-2.87	1.56×10^{06}	0.002
2424.552	394195	e	1.5	435428	o	1.5	-2.15	7.83×10^{06}	0.021
2444.443	384781	e	0.5	425678	o	0.5	-1.68	2.38×10^{07}	0.065
2462.170	394195	e	1.5	434798	o	0.5	-1.65	2.44×10^{07}	0.086
2560.656	482699	o	0.5	521740	e	1.5	-6.76	1.77×10^{02}	0.000
2691.808	484897	o	1.5	522036	e	2.5	-2.63	2.16×10^{06}	0.010
2713.430	484897	o	1.5	521740	e	1.5	-2.65	2.05×10^{06}	0.009
2740.679	384781	e	0.5	421258	o	1.5	-3.48	2.98×10^{05}	0.003

Table A.11. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
2788.253	423223	e	0.5	459078	o	1.5	-3.16	5.97×10^{05}	0.015
2932.229	393555	e	2.5	427649	o	3.5	-2.57	2.05×10^{06}	0.004
2962.607	482699	o	0.5	516443	e	0.5	-3.37	3.23×10^{05}	0.005
2978.575	393555	e	2.5	427119	o	2.5	-4.80	1.21×10^{04}	0.000
3036.490	394195	e	1.5	427119	o	2.5	-5.21	4.44×10^{03}	0.000
3061.456	423223	e	0.5	455878	o	1.5	-2.00	7.20×10^{06}	0.076
3078.734	482699	o	0.5	515171	e	1.5	-4.08	5.90×10^{04}	0.001
3169.035	484897	o	1.5	516443	e	0.5	-2.33	3.13×10^{06}	0.039
3175.430	394195	e	1.5	425678	o	0.5	-1.97	7.21×10^{06}	0.035
3302.271	484897	o	1.5	515171	e	1.5	-2.86	8.42×10^{05}	0.008
3381.058	484897	o	1.5	514465	e	2.5	-3.36	2.53×10^{05}	0.003
3515.682	393555	e	2.5	421991	o	2.5	-2.63	1.25×10^{06}	0.006
3596.650	394195	e	1.5	421991	o	2.5	-3.70	1.02×10^{05}	0.002
3608.737	393555	e	2.5	421258	o	1.5	-2.23	3.05×10^{06}	0.017
3694.100	394195	e	1.5	421258	o	1.5	-2.41	1.94×10^{06}	0.024
4616.390	423223	e	0.5	444879	o	1.5	-3.31	1.56×10^{05}	0.005
4734.284	423223	e	0.5	444340	o	0.5	-3.11	2.37×10^{05}	0.009
5198.706	423223	e	0.5	442454	o	1.5	-2.92	2.97×10^{05}	0.005
7013.862	423223	e	0.5	437477	o	1.5	-2.68	2.92×10^{05}	0.020
7331.697	423223	e	0.5	436859	o	0.5	-4.70	2.44×10^{03}	0.000
8191.628	423223	e	0.5	435428	o	1.5	-3.66	2.05×10^{04}	0.003
8637.459	423223	e	0.5	434798	o	0.5	-3.28	4.61×10^{04}	0.010
40738.177	423223	e	0.5	425678	o	0.5	-4.14	3.75×10^{02}	0.007
50877.641	421258	o	1.5	423223	e	0.5	-4.63	5.39×10^{01}	0.002

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from **Reader & Lindsay (2016)**.

Table A.12. Calculated HFR oscillator strengths (log gf) and transition probabilities (gA) in Zr vii. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
213.117	0	e	2.0	469225	o	1.0	-2.32	7.09×10^{08}	0.010
214.536	0	e	2.0	466123	o	2.0	-1.18	9.67×10^{09}	0.060
218.320	0	e	2.0	458043	o	1.0	-1.64	3.18×10^{09}	0.054
218.977	12557	e	0.0	469225	o	1.0	-1.92	1.67×10^{09}	0.024
219.454	13549	e	1.0	469225	o	1.0	-1.90	1.75×10^{09}	0.050
220.958	13549	e	1.0	466123	o	2.0	-0.52	4.12×10^{10}	0.594
224.474	12557	e	0.0	458043	o	1.0	-0.66	2.89×10^{10}	0.597
224.975	13549	e	1.0	458043	o	1.0	-1.23	7.86×10^{09}	0.287
225.630	0	e	2.0	443204	o	2.0	-1.00	1.30×10^{10}	0.169
225.646	13549	e	1.0	456721	o	0.0	-0.99	1.35×10^{10}	0.484
226.219	27176	e	2.0	469225	o	1.0	-0.39	5.28×10^{10}	0.461
227.514	0	e	2.0	439534	o	3.0	-0.10	1.03×10^{11}	0.695
227.818	27176	e	2.0	466123	o	2.0	-0.47	4.36×10^{10}	0.556
229.983	0	e	2.0	434815	o	1.0	-2.26	6.88×10^{08}	0.015
230.009	0	e	2.0	434766	o	2.0	-0.33	5.86×10^{10}	0.614
232.090	27176	e	2.0	458043	o	1.0	-0.84	1.80×10^{10}	0.436
232.745	13549	e	1.0	443204	o	2.0	-0.91	1.51×10^{10}	0.628
236.822	12557	e	0.0	434815	o	1.0	-1.20	7.59×10^{09}	0.113
237.380	13549	e	1.0	434815	o	1.0	-0.41	4.64×10^{10}	0.688
237.407	13549	e	1.0	434766	o	2.0	-0.77	2.03×10^{10}	0.224

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
239.020	0	e	2.0	418375	o	1.0	-0.01	1.13×10^{11}	0.763
240.368	27176	e	2.0	443204	o	2.0	0.15	1.65×10^{11}	0.710
242.508	27176	e	2.0	439534	o	3.0	-1.15	8.03×10^9	0.621
242.552	56943	e	0.0	469225	o	1.0	-0.29	5.85×10^{10}	0.803
244.633	0	e	2.0	408775	o	2.0	-1.43	4.19×10^9	0.430
245.315	27176	e	2.0	434815	o	1.0	-1.37	4.70×10^9	0.275
245.345	27176	e	2.0	434766	o	2.0	-1.14	7.96×10^9	0.149
246.416	12557	e	0.0	418375	o	1.0	-0.68	2.31×10^{10}	0.481
247.020	13549	e	1.0	418375	o	1.0	-0.51	3.38×10^{10}	0.371
249.314	56943	e	0.0	458043	o	1.0	-1.52	3.22×10^9	0.115
251.264	0	e	2.0	397987	o	1.0	-2.50	3.33×10^8	0.005
253.020	13549	e	1.0	408775	o	2.0	-3.13	7.70×10^7	0.018
255.624	27176	e	2.0	418375	o	1.0	-1.80	1.62×10^9	0.050
259.450	12557	e	0.0	397987	o	1.0	-1.78	1.65×10^9	0.006
260.120	13549	e	1.0	397987	o	1.0	-1.38	4.11×10^9	0.064
262.055	27176	e	2.0	408775	o	2.0	-3.15	6.81×10^7	0.025
262.909	0	e	2.0	380360	o	3.0	-1.44	3.51×10^9	0.006
264.640	56943	e	0.0	434815	o	1.0	-2.02	9.02×10^8	0.048
269.273	0	e	2.0	371371	o	2.0	-2.12	7.03×10^8	0.002
269.679	27176	e	2.0	397987	o	1.0	-1.03	8.52×10^9	0.069
274.050	0	e	2.0	364897	o	1.0	-1.12	6.71×10^9	0.193
276.677	56943	e	0.0	418375	o	1.0	-4.19	5.60×10^6	0.000
277.641	0	e	2.0	360177	o	2.0	0.00	8.70×10^{10}	0.160
279.469	13549	e	1.0	371371	o	2.0	0.04	9.43×10^{10}	0.490
281.828	201981	o	1.0	556807	e	0.0	-0.69	1.71×10^{10}	0.265
282.219	0	e	2.0	354335	o	1.0	-0.70	1.67×10^{10}	0.042
283.139	27176	e	2.0	380360	o	3.0	1.05	9.39×10^{11}	0.605
283.404	0	e	2.0	352853	o	3.0	0.99	8.20×10^{11}	0.604
283.817	12557	e	0.0	364897	o	1.0	0.38	2.00×10^{11}	0.560
284.618	13549	e	1.0	364897	o	1.0	0.26	1.51×10^{11}	0.609
286.008	192812	o	2.0	542453	e	1.0	-1.40	3.19×10^9	0.138
287.482	192812	o	2.0	540660	e	2.0	0.18	1.23×10^{11}	0.293
288.494	13549	e	1.0	360177	o	2.0	0.71	4.14×10^{11}	0.607
288.632	0	e	2.0	346462	o	3.0	-0.50	2.51×10^{10}	0.064
288.921	192812	o	2.0	538927	e	2.0	-2.08	6.56×10^8	0.037
289.675	0	e	2.0	345215	o	1.0	-0.12	6.01×10^{10}	0.203
290.380	192812	o	2.0	537188	e	1.0	-1.63	1.86×10^9	0.040
290.533	27176	e	2.0	371371	o	2.0	0.67	3.71×10^{11}	0.551
290.843	0	e	2.0	343828	o	2.0	0.71	4.06×10^{11}	0.561
291.805	0	e	2.0	342695	o	1.0	0.34	1.68×10^{11}	0.452
292.311	13549	e	1.0	355650	o	0.0	0.14	1.07×10^{11}	0.542
292.588	12557	e	0.0	354335	o	1.0	-0.06	6.73×10^{10}	0.365
292.678	192812	o	2.0	534485	e	3.0	-2.43	2.88×10^8	0.004
293.217	56943	e	0.0	397987	o	1.0	0.57	2.84×10^{11}	0.656
293.439	13549	e	1.0	354335	o	1.0	-0.02	7.45×10^{10}	0.478
293.709	201981	o	1.0	542453	e	1.0	-2.03	7.22×10^8	0.015
295.264	201981	o	1.0	540660	e	2.0	-0.82	1.17×10^{10}	0.055
295.981	192812	o	2.0	530672	e	1.0	-1.46	2.67×10^9	0.077
296.102	27176	e	2.0	364897	o	1.0	-2.15	5.38×10^8	0.033
296.544	192812	o	2.0	530030	e	1.0	-2.75	1.37×10^8	0.005
296.783	201981	o	1.0	538927	e	2.0	-2.17	5.07×10^8	0.020
298.323	201981	o	1.0	537188	e	1.0	-1.59	1.91×10^9	0.010
298.662	192812	o	2.0	527639	e	2.0	-3.37	3.18×10^7	0.001
299.567	208638	o	0.0	542453	e	1.0	-1.59	1.91×10^9	0.050
300.299	27176	e	2.0	360177	o	2.0	-0.16	5.08×10^{10}	0.168

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
300.609	12557	e	0.0	345215	o	1.0	-0.17	4.94 × 10 ¹⁰	0.313
301.508	13549	e	1.0	345215	o	1.0	-0.22	4.44 × 10 ¹⁰	0.424
301.698	192812	o	2.0	524269	e	2.0	-2.81	1.15 × 10 ⁰⁸	0.002
302.774	13549	e	1.0	343828	o	2.0	-0.27	3.91 × 10 ¹⁰	0.124
302.864	192812	o	2.0	522993	e	1.0	-3.25	4.15 × 10 ⁰⁷	0.005
302.904	12557	e	0.0	342695	o	1.0	-1.16	5.01 × 10 ⁰⁹	0.042
302.915	0	e	2.0	330126	o	2.0	-0.18	4.78 × 10 ¹⁰	0.151
303.817	13549	e	1.0	342695	o	1.0	-0.51	2.21 × 10 ¹⁰	0.097
304.237	201981	o	1.0	530672	e	1.0	-1.18	4.71 × 10 ⁰⁹	0.187
304.312	201981	o	1.0	530591	e	0.0	-3.75	1.27 × 10 ⁰⁷	0.001
304.368	208638	o	0.0	537188	e	1.0	-1.40	2.89 × 10 ⁰⁹	0.016
304.622	0	e	2.0	328276	o	3.0	-0.66	1.58 × 10 ¹⁰	0.017
304.832	201981	o	1.0	530030	e	1.0	-2.40	2.89 × 10 ⁰⁸	0.010
305.662	27176	e	2.0	354335	o	1.0	0.18	1.07 × 10 ¹¹	0.404
307.053	27176	e	2.0	352853	o	3.0	-2.46	2.46 × 10 ⁰⁸	0.001
307.070	201981	o	1.0	527639	e	2.0	-3.81	1.09 × 10 ⁰⁷	0.000
308.766	0	e	2.0	323870	o	1.0	-0.62	1.63 × 10 ¹⁰	0.085
308.918	0	e	2.0	323711	o	2.0	-1.49	2.27 × 10 ⁰⁹	0.029
310.167	0	e	2.0	322407	o	3.0	-1.16	4.78 × 10 ⁰⁹	0.148
310.281	201981	o	1.0	524269	e	2.0	-1.95	7.79 × 10 ⁰⁸	0.009
310.526	208638	o	0.0	530672	e	1.0	-1.49	2.25 × 10 ⁰⁹	0.159
311.147	208638	o	0.0	530030	e	1.0	-2.21	4.30 × 10 ⁰⁸	0.019
311.514	201981	o	1.0	522993	e	1.0	-2.09	5.67 × 10 ⁰⁸	0.008
311.537	0	e	2.0	320989	o	2.0	-2.10	5.45 × 10 ⁰⁸	0.002
313.124	192812	o	2.0	512175	e	2.0	-1.25	3.81 × 10 ⁰⁹	0.100
313.199	27176	e	2.0	346462	o	3.0	-4.43	2.49 × 10 ⁰⁶	0.000
314.427	27176	e	2.0	345215	o	1.0	0.19	1.03 × 10 ¹¹	0.259
315.804	27176	e	2.0	343828	o	2.0	-0.85	9.52 × 10 ⁰⁹	0.089
315.879	13549	e	1.0	330126	o	2.0	-0.87	9.05 × 10 ⁰⁹	0.063
316.938	27176	e	2.0	342695	o	1.0	-0.75	1.17 × 10 ¹⁰	0.333
317.404	192812	o	2.0	507868	e	3.0	-1.36	2.86 × 10 ⁰⁹	0.103
318.112	208638	o	0.0	522993	e	1.0	-1.72	1.26 × 10 ⁰⁹	0.023
318.666	201981	o	1.0	515789	e	0.0	-1.42	2.52 × 10 ⁰⁹	0.190
318.744	192812	o	2.0	506544	e	2.0	-1.61	1.57 × 10 ⁰⁹	0.105
319.384	243704	o	1.0	556807	e	0.0	-2.04	5.94 × 10 ⁰⁸	0.028
319.502	0	e	2.0	312987	o	1.0	-1.96	7.21 × 10 ⁰⁸	0.031
320.426	192812	o	2.0	504897	e	1.0	-2.27	3.46 × 10 ⁰⁸	0.146
320.528	0	e	2.0	311985	o	2.0	-1.32	3.07 × 10 ⁰⁹	0.023
320.854	192812	o	2.0	504480	e	3.0	-1.88	8.62 × 10 ⁰⁸	0.179
321.220	12557	e	0.0	323870	o	1.0	-2.80	1.00 × 10 ⁰⁸	0.001
322.247	13549	e	1.0	323870	o	1.0	-1.51	1.92 × 10 ⁰⁹	0.017
322.378	201981	o	1.0	512175	e	2.0	-1.37	2.73 × 10 ⁰⁹	0.141
322.412	13549	e	1.0	323711	o	2.0	-0.80	1.02 × 10 ¹⁰	0.124
323.639	192812	o	2.0	501798	e	3.0	-2.12	4.82 × 10 ⁰⁸	0.020
324.724	56943	e	0.0	364897	o	1.0	-3.62	1.51 × 10 ⁰⁷	0.000
325.267	13549	e	1.0	320989	o	2.0	-1.06	5.46 × 10 ⁰⁹	0.013
327.636	192812	o	2.0	498029	e	2.0	-2.51	1.92 × 10 ⁰⁸	0.015
328.339	201981	o	1.0	506544	e	2.0	-2.32	2.87 × 10 ⁰⁸	0.014
329.109	13549	e	1.0	317400	o	0.0	-2.55	1.75 × 10 ⁰⁸	0.003
330.087	27176	e	2.0	330126	o	2.0	-1.21	3.75 × 10 ⁰⁹	0.054
330.124	201981	o	1.0	504897	e	1.0	-4.88	8.03 × 10 ⁰⁵	0.000
332.116	27176	e	2.0	328276	o	3.0	-1.40	2.44 × 10 ⁰⁹	0.007
332.856	12557	e	0.0	312987	o	1.0	-0.93	7.06 × 10 ⁰⁹	0.038
333.959	13549	e	1.0	312987	o	1.0	-1.97	6.49 × 10 ⁰⁸	0.004
334.238	192812	o	2.0	492000	e	1.0	-2.46	2.11 × 10 ⁰⁸	0.043

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
334.729	243704	o	1.0	542453	e	1.0	-2.61	1.44 × 10 ⁰⁸	0.004
335.080	13549	e	1.0	311985	o	2.0	-1.93	6.91 × 10 ⁰⁸	0.015
336.257	56943	e	0.0	354335	o	1.0	-0.57	1.58 × 10 ¹⁰	0.319
336.750	243704	o	1.0	540660	e	2.0	-3.12	4.52 × 10 ⁰⁷	0.001
337.048	27176	e	2.0	323870	o	1.0	-1.46	2.00 × 10 ⁰⁹	0.043
337.065	0	e	2.0	296679	o	3.0	-1.48	1.92 × 10 ⁰⁹	0.134
337.228	27176	e	2.0	323711	o	2.0	-1.26	3.22 × 10 ⁰⁹	0.106
337.542	208638	o	0.0	504897	e	1.0	-2.33	2.70 × 10 ⁰⁸	0.036
337.782	201981	o	1.0	498029	e	2.0	-2.23	3.43 × 10 ⁰⁸	0.018
338.718	27176	e	2.0	322407	o	3.0	-1.36	2.53 × 10 ⁰⁹	0.211
338.727	243704	o	1.0	538927	e	2.0	-2.89	7.46 × 10 ⁰⁷	0.002
340.353	27176	e	2.0	320989	o	2.0	-3.06	5.07 × 10 ⁰⁷	0.001
340.497	263119	o	1.0	556807	e	0.0	-5.93	6.76 × 10 ⁰⁴	0.000
340.734	243704	o	1.0	537188	e	1.0	-1.25	3.27 × 10 ⁰⁹	0.037
343.550	192812	o	2.0	483891	e	2.0	-2.14	4.14 × 10 ⁰⁸	0.006
344.804	201981	o	1.0	492000	e	1.0	-1.88	7.49 × 10 ⁰⁸	0.050
346.895	56943	e	0.0	345215	o	1.0	-0.84	7.96 × 10 ⁰⁹	0.101
347.158	0	e	2.0	288053	o	3.0	-2.09	4.49 × 10 ⁰⁸	0.004
347.407	192812	o	2.0	480659	e	1.0	-2.01	5.42 × 10 ⁰⁸	0.027
348.471	243704	o	1.0	530672	e	1.0	-2.01	5.40 × 10 ⁰⁸	0.097
348.569	243704	o	1.0	530591	e	0.0	-4.22	3.31 × 10 ⁰⁶	0.002
349.252	243704	o	1.0	530030	e	1.0	-2.29	2.81 × 10 ⁰⁸	0.021
349.882	27176	e	2.0	312987	o	1.0	-1.44	2.00 × 10 ⁰⁹	0.151
349.954	56943	e	0.0	342695	o	1.0	-3.01	5.27 × 10 ⁰⁷	0.003
350.210	0	e	2.0	285543	o	2.0	-1.88	7.17 × 10 ⁰⁸	0.014
351.112	27176	e	2.0	311985	o	2.0	-0.95	5.99 × 10 ⁰⁹	0.023
352.167	201981	o	1.0	485937	e	0.0	-3.01	5.27 × 10 ⁰⁷	0.009
352.193	243704	o	1.0	527639	e	2.0	-1.51	1.69 × 10 ⁰⁹	0.015
352.905	208638	o	0.0	492000	e	1.0	-2.55	1.55 × 10 ⁰⁸	0.016
354.084	0	e	2.0	282419	o	1.0	-2.37	2.27 × 10 ⁰⁸	0.014
354.723	201981	o	1.0	483891	e	2.0	-4.55	1.51 × 10 ⁰⁶	0.000
356.062	0	e	2.0	280850	o	3.0	-3.03	4.96 × 10 ⁰⁷	0.000
356.424	243704	o	1.0	524269	e	2.0	-1.41	2.02 × 10 ⁰⁹	0.063
357.436	262683	o	0.0	542453	e	1.0	-1.68	1.09 × 10 ⁰⁹	0.077
357.994	263119	o	1.0	542453	e	1.0	-1.60	1.29 × 10 ⁰⁹	0.077
358.052	243704	o	1.0	522993	e	1.0	-1.37	2.21 × 10 ⁰⁹	0.021
358.743	263702	o	2.0	542453	e	1.0	-2.30	2.55 × 10 ⁰⁸	0.015
358.836	201981	o	1.0	480659	e	1.0	-4.60	1.30 × 10 ⁰⁶	0.000
360.307	263119	o	1.0	540660	e	2.0	-2.21	3.20 × 10 ⁰⁸	0.016
361.066	263702	o	2.0	540660	e	2.0	-2.12	3.95 × 10 ⁰⁸	0.010
361.560	264081	o	3.0	540660	e	2.0	-2.55	1.45 × 10 ⁰⁸	0.003
362.571	263119	o	1.0	538927	e	2.0	-1.81	7.71 × 10 ⁰⁸	0.086
362.646	13549	e	1.0	289300	o	0.0	-2.78	8.58 × 10 ⁰⁷	0.027
363.084	0	e	2.0	275418	o	2.0	-1.89	6.54 × 10 ⁰⁸	0.007
363.339	263702	o	2.0	538927	e	2.0	-1.93	5.88 × 10 ⁰⁸	0.039
363.840	264081	o	3.0	538927	e	2.0	-2.80	7.98 × 10 ⁰⁷	0.008
364.292	262683	o	0.0	537188	e	1.0	-0.95	5.66 × 10 ⁰⁹	0.087
364.872	263119	o	1.0	537188	e	1.0	-0.96	5.44 × 10 ⁰⁹	0.079
365.649	263702	o	2.0	537188	e	1.0	-1.83	7.49 × 10 ⁰⁸	0.021
367.532	243704	o	1.0	515789	e	0.0	-1.95	5.59 × 10 ⁰⁸	0.070
367.619	208638	o	0.0	480659	e	1.0	-3.08	4.14 × 10 ⁰⁷	0.002
367.655	13549	e	1.0	285543	o	2.0	-4.24	2.83 × 10 ⁰⁶	0.000
369.299	263702	o	2.0	534485	e	3.0	-2.97	5.26 × 10 ⁰⁷	0.006
369.817	264081	o	3.0	534485	e	3.0	-3.56	1.36 × 10 ⁰⁷	0.001
370.560	12557	e	0.0	282419	o	1.0	-2.77	8.30 × 10 ⁰⁷	0.001

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
370.945	264903	o	4.0	534485	e	3.0	-3.37	2.06×10^{07}	0.001
371.053	27176	e	2.0	296679	o	3.0	-1.78	8.03×10^{08}	0.039
371.927	13549	e	1.0	282419	o	1.0	-2.40	1.91×10^{08}	0.002
372.480	243704	o	1.0	512175	e	2.0	-2.67	1.03×10^{08}	0.013
373.150	262683	o	0.0	530672	e	1.0	-3.04	4.34×10^{07}	0.024
373.758	263119	o	1.0	530672	e	1.0	-3.01	4.61×10^{07}	0.014
373.871	263119	o	1.0	530591	e	0.0	-4.98	5.02×10^{05}	0.000
374.046	262683	o	0.0	530030	e	1.0	-3.05	4.22×10^{07}	0.012
374.483	275418	o	2.0	542453	e	1.0	-6.16	3.21×10^{04}	0.000
374.574	263702	o	2.0	530672	e	1.0	-3.82	7.30×10^{06}	0.002
374.634	56943	e	0.0	323870	o	1.0	-2.98	4.88×10^{07}	0.002
374.657	263119	o	1.0	530030	e	1.0	-4.07	4.01×10^{06}	0.001
375.477	263702	o	2.0	530030	e	1.0	-2.97	5.13×10^{07}	0.005
377.014	275418	o	2.0	540660	e	2.0	-2.63	1.11×10^{08}	0.001
378.043	263119	o	1.0	527639	e	2.0	-5.74	8.47×10^{04}	0.000
378.672	0	e	2.0	264081	o	3.0	-1.94	5.34×10^{08}	0.018
378.878	263702	o	2.0	527639	e	2.0	-3.00	4.67×10^{07}	0.002
379.216	0	e	2.0	263702	o	2.0	-1.74	8.39×10^{08}	0.082
379.423	264081	o	3.0	527639	e	2.0	-3.97	5.08×10^{06}	0.000
379.494	275418	o	2.0	538927	e	2.0	-2.83	6.68×10^{07}	0.001
380.056	0	e	2.0	263119	o	1.0	-1.99	4.78×10^{08}	0.184
380.460	243704	o	1.0	506544	e	2.0	-3.42	1.68×10^{07}	0.009
381.870	13549	e	1.0	275418	o	2.0	-4.32	2.20×10^{06}	0.000
382.015	275418	o	2.0	537188	e	1.0	-2.52	1.39×10^{08}	0.001
382.859	243704	o	1.0	504897	e	1.0	-1.35	2.03×10^{09}	0.107
382.922	263119	o	1.0	524269	e	2.0	-4.35	2.03×10^{06}	0.000
383.322	27176	e	2.0	288053	o	3.0	-2.52	1.36×10^{08}	0.010
383.778	263702	o	2.0	524269	e	2.0	-3.22	2.71×10^{07}	0.001
384.157	262683	o	0.0	522993	e	1.0	-3.00	4.56×10^{07}	0.008
384.337	264081	o	3.0	524269	e	2.0	-3.27	2.44×10^{07}	0.001
384.565	282419	o	1.0	542453	e	1.0	-2.47	1.50×10^{08}	0.006
384.802	263119	o	1.0	522993	e	1.0	-2.71	8.89×10^{07}	0.014
384.897	280850	o	3.0	540660	e	2.0	-2.83	6.78×10^{07}	0.000
385.667	263702	o	2.0	522993	e	1.0	-4.15	3.20×10^{06}	0.000
386.001	275418	o	2.0	534485	e	3.0	-2.44	1.61×10^{08}	0.004
387.046	27176	e	2.0	285543	o	2.0	-4.50	1.40×10^{06}	0.000
387.235	282419	o	1.0	540660	e	2.0	-2.16	3.09×10^{08}	0.010
387.481	280850	o	3.0	538927	e	2.0	-3.97	4.73×10^{06}	0.000
389.241	285543	o	2.0	542453	e	1.0	-2.54	1.27×10^{08}	0.003
389.851	282419	o	1.0	538927	e	2.0	-2.20	2.74×10^{08}	0.028
390.558	56943	e	0.0	312987	o	1.0	-2.07	3.79×10^{08}	0.012
391.767	275418	o	2.0	530672	e	1.0	-2.54	1.25×10^{08}	0.007
391.784	27176	e	2.0	282419	o	1.0	-3.70	8.69×10^{06}	0.005
391.977	285543	o	2.0	540660	e	2.0	-2.72	8.31×10^{07}	0.001
392.512	282419	o	1.0	537188	e	1.0	-1.90	5.37×10^{08}	0.009
392.754	275418	o	2.0	530030	e	1.0	-3.52	1.31×10^{07}	0.000
393.198	243704	o	1.0	498029	e	2.0	-2.64	1.00×10^{08}	0.063
394.207	27176	e	2.0	280850	o	3.0	-6.06	3.73×10^{04}	0.000
394.267	280850	o	3.0	534485	e	3.0	-0.92	5.17×10^{09}	0.060
394.658	285543	o	2.0	538927	e	2.0	-2.73	7.83×10^{07}	0.004
395.018	289300	o	0.0	542453	e	1.0	-1.53	1.25×10^{09}	0.099
395.773	263119	o	1.0	515789	e	0.0	-3.65	9.48×10^{06}	0.025
395.872	288053	o	3.0	540660	e	2.0	-3.58	1.15×10^{07}	0.000
396.478	275418	o	2.0	527639	e	2.0	-1.12	3.18×10^{09}	0.016
397.385	285543	o	2.0	537188	e	1.0	-1.83	6.28×10^{08}	0.007

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
398.606	288053	o	3.0	538927	e	2.0	-1.89	5.34×10^{08}	0.019
399.103	12557	e	0.0	263119	o	1.0	-2.75	7.50×10^{07}	0.022
399.755	13549	e	1.0	263702	o	2.0	-5.69	8.59×10^{04}	0.000
400.689	13549	e	1.0	263119	o	1.0	-2.36	1.83×10^{08}	0.062
401.390	13549	e	1.0	262683	o	0.0	-2.32	1.99×10^{08}	0.111
401.516	263119	o	1.0	512175	e	2.0	-3.30	2.10×10^{07}	0.020
401.700	285543	o	2.0	534485	e	3.0	-2.17	2.78×10^{08}	0.017
401.847	275418	o	2.0	524269	e	2.0	-1.82	6.21×10^{08}	0.004
402.458	263702	o	2.0	512175	e	2.0	-3.27	2.27×10^{07}	0.005
402.745	243704	o	1.0	492000	e	1.0	-1.35	1.89×10^{09}	0.101
402.815	282419	o	1.0	530672	e	1.0	-2.41	1.59×10^{08}	0.021
402.833	27176	e	2.0	275418	o	2.0	-2.45	1.47×10^{08}	0.004
402.946	282419	o	1.0	530591	e	0.0	-3.06	3.59×10^{07}	0.004
403.073	264081	o	3.0	512175	e	2.0	-2.71	8.18×10^{07}	0.009
403.408	289300	o	0.0	537188	e	1.0	-2.10	3.25×10^{08}	0.008
403.859	282419	o	1.0	530030	e	1.0	-4.93	4.73×10^{05}	0.000
403.918	275418	o	2.0	522993	e	1.0	-2.10	3.24×10^{08}	0.003
405.204	280850	o	3.0	527639	e	2.0	-2.33	1.91×10^{08}	0.002
405.791	288053	o	3.0	534485	e	3.0	-1.65	9.11×10^{08}	0.016
407.797	282419	o	1.0	527639	e	2.0	-2.23	2.39×10^{08}	0.002
407.948	285543	o	2.0	530672	e	1.0	-3.49	1.31×10^{07}	0.001
409.020	285543	o	2.0	530030	e	1.0	-2.19	2.57×10^{08}	0.017
409.557	263702	o	2.0	507868	e	3.0	-7.83	5.90×10^{02}	0.000
409.868	296679	o	3.0	540660	e	2.0	-4.76	6.98×10^{05}	0.000
410.139	312987	o	1.0	556807	e	0.0	-2.93	4.60×10^{07}	0.001
410.194	264081	o	3.0	507868	e	3.0	-2.10	3.15×10^{08}	0.044
410.334	0	e	2.0	243704	o	1.0	-1.48	1.33×10^{09}	0.035
410.641	264081	o	3.0	507603	e	4.0	-2.81	6.24×10^{07}	0.013
410.804	263119	o	1.0	506544	e	2.0	-3.44	1.40×10^{07}	0.010
410.814	280850	o	3.0	524269	e	2.0	-3.61	9.73×10^{06}	0.000
411.501	291472	o	4.0	534485	e	3.0	-0.75	7.07×10^{09}	0.055
411.582	264903	o	4.0	507868	e	3.0	-3.14	2.88×10^{07}	0.009
411.790	263702	o	2.0	506544	e	2.0	-2.04	3.48×10^{08}	0.052
412.031	264903	o	4.0	507603	e	4.0	-2.11	3.12×10^{08}	0.105
412.434	264081	o	3.0	506544	e	2.0	-3.42	1.46×10^{07}	0.001
412.800	296679	o	3.0	538927	e	2.0	-1.76	6.80×10^{08}	0.019
412.826	243704	o	1.0	485937	e	0.0	-2.90	4.88×10^{07}	0.089
412.858	262683	o	0.0	504897	e	1.0	-5.33	1.82×10^{05}	0.000
413.059	285543	o	2.0	527639	e	2.0	-1.92	4.69×10^{08}	0.004
413.479	282419	o	1.0	524269	e	2.0	-1.47	1.32×10^{09}	0.020
413.603	263119	o	1.0	504897	e	1.0	-3.58	1.01×10^{07}	0.014
414.298	289300	o	0.0	530672	e	1.0	-2.07	3.29×10^{08}	0.084
414.602	263702	o	2.0	504897	e	1.0	-2.46	1.33×10^{08}	0.045
415.320	263702	o	2.0	504480	e	3.0	-4.38	1.64×10^{06}	0.002
415.403	289300	o	0.0	530030	e	1.0	-1.75	6.79×10^{08}	0.140
415.673	282419	o	1.0	522993	e	1.0	-2.44	1.42×10^{08}	0.003
415.975	264081	o	3.0	504480	e	3.0	-3.56	1.08×10^{07}	0.004
416.342	243704	o	1.0	483891	e	2.0	-5.48	1.29×10^{05}	0.000
417.387	288053	o	3.0	527639	e	2.0	-1.73	7.22×10^{08}	0.007
417.402	264903	o	4.0	504480	e	3.0	-2.67	8.21×10^{07}	0.015
418.890	285543	o	2.0	524269	e	2.0	-2.24	2.18×10^{08}	0.002
419.999	263702	o	2.0	501798	e	3.0	-2.75	6.81×10^{07}	0.017
420.511	296679	o	3.0	534485	e	3.0	-2.36	1.67×10^{08}	0.012
420.668	264081	o	3.0	501798	e	3.0	-3.16	2.65×10^{07}	0.002
421.141	285543	o	2.0	522993	e	1.0	-1.79	6.18×10^{08}	0.007

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
422.021	243704	o	1.0	480659	e	1.0	-2.19	2.42×10^{08}	0.060
422.110	27176	e	2.0	264081	o	3.0	-3.89	4.84×10^{06}	0.001
422.128	264903	o	4.0	501798	e	3.0	-2.52	1.14×10^{08}	0.007
422.374	275418	o	2.0	512175	e	2.0	-1.77	6.32×10^{08}	0.023
422.787	27176	e	2.0	263702	o	2.0	-3.69	7.63×10^{06}	0.003
423.341	288053	o	3.0	524269	e	2.0	-0.82	5.62×10^{09}	0.062
423.365	298282	o	4.0	534485	e	3.0	-1.04	3.43×10^{09}	0.058
423.831	27176	e	2.0	263119	o	1.0	-3.90	4.68×10^{06}	0.009
425.695	263119	o	1.0	498029	e	2.0	-3.00	3.68×10^{07}	0.022
426.754	263702	o	2.0	498029	e	2.0	-4.18	2.44×10^{06}	0.000
427.445	264081	o	3.0	498029	e	2.0	-4.13	2.73×10^{06}	0.000
427.912	289300	o	0.0	522993	e	1.0	-3.40	1.46×10^{07}	0.000
428.504	282419	o	1.0	515789	e	0.0	-2.12	2.75×10^{08}	0.026
429.301	323870	o	1.0	556807	e	0.0	-3.68	7.74×10^{06}	0.000
430.200	275418	o	2.0	507868	e	3.0	-2.49	1.16×10^{08}	0.005
432.292	280850	o	3.0	512175	e	2.0	-2.29	1.84×10^{08}	0.004
432.625	12557	e	0.0	243704	o	1.0	-2.52	1.08×10^{08}	0.007
432.664	275418	o	2.0	506544	e	2.0	-1.18	2.27×10^{09}	0.047
432.810	303437	o	4.0	534485	e	3.0	-2.06	3.13×10^{08}	0.004
432.975	296679	o	3.0	527639	e	2.0	-0.88	4.71×10^{09}	0.050
433.900	311985	o	2.0	542453	e	1.0	-1.17	2.39×10^{09}	0.040
434.490	13549	e	1.0	243704	o	1.0	-2.61	8.64×10^{07}	0.041
435.244	282419	o	1.0	512175	e	2.0	-2.66	7.74×10^{07}	0.011
435.770	275418	o	2.0	504897	e	1.0	-1.16	2.40×10^{09}	0.083
435.794	312987	o	1.0	542453	e	1.0	-2.26	1.91×10^{08}	0.006
436.078	262683	o	0.0	492000	e	1.0	-3.68	7.52×10^{06}	0.007
436.563	275418	o	2.0	504480	e	3.0	-1.77	5.99×10^{08}	0.108
436.908	263119	o	1.0	492000	e	1.0	-2.52	1.08×10^{08}	0.059
437.302	311985	o	2.0	540660	e	2.0	-3.46	1.25×10^{07}	0.000
438.024	263702	o	2.0	492000	e	1.0	-3.46	1.23×10^{07}	0.003
439.226	312987	o	1.0	540660	e	2.0	-2.60	8.71×10^{07}	0.004
439.387	296679	o	3.0	524269	e	2.0	-3.91	4.31×10^{06}	0.000
440.494	280850	o	3.0	507868	e	3.0	-0.69	7.06×10^{09}	0.119
440.641	311985	o	2.0	538927	e	2.0	-1.41	1.32×10^{09}	0.026
441.008	280850	o	3.0	507603	e	4.0	-1.87	4.64×10^{08}	0.013
441.244	285543	o	2.0	512175	e	2.0	-1.97	3.68×10^{08}	0.020
441.735	275418	o	2.0	501798	e	3.0	-4.81	5.26×10^{05}	0.000
442.595	312987	o	1.0	538927	e	2.0	-3.14	2.45×10^{07}	0.002
443.078	280850	o	3.0	506544	e	2.0	-0.80	5.20×10^{09}	0.133
443.506	56943	e	0.0	282419	o	1.0	-3.52	1.04×10^{07}	0.001
444.044	311985	o	2.0	537188	e	1.0	-2.87	4.64×10^{07}	0.001
444.340	317400	o	0.0	542453	e	1.0	-1.46	1.14×10^{09}	0.069
446.028	312987	o	1.0	537188	e	1.0	-1.37	1.42×10^{09}	0.019
446.180	282419	o	1.0	506544	e	2.0	-2.23	1.91×10^{08}	0.014
446.186	288053	o	3.0	512175	e	2.0	-1.31	1.65×10^{09}	0.060
447.167	280850	o	3.0	504480	e	3.0	-1.46	1.16×10^{09}	0.091
448.797	263119	o	1.0	485937	e	0.0	-3.10	2.63×10^{07}	0.063
449.214	275418	o	2.0	498029	e	2.0	-1.40	1.30×10^{09}	0.027
449.438	311985	o	2.0	534485	e	3.0	-2.31	1.64×10^{08}	0.006
449.483	282419	o	1.0	504897	e	1.0	-1.50	1.02×10^{09}	0.111
449.792	285543	o	2.0	507868	e	3.0	-3.19	2.12×10^{07}	0.001
451.541	320989	o	2.0	542453	e	1.0	-2.77	5.46×10^{07}	0.001
452.487	285543	o	2.0	506544	e	2.0	-1.83	4.66×10^{08}	0.010
452.595	280850	o	3.0	501798	e	3.0	-1.09	2.62×10^{09}	0.058
452.956	263119	o	1.0	483891	e	2.0	-1.60	8.18×10^{08}	0.207

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
454.155	263702	o	2.0	483891	e	2.0	-1.30	1.66 × 10 ⁰⁹	0.117
454.928	288053	o	3.0	507868	e	3.0	-1.71	6.38 × 10 ⁰⁸	0.010
454.938	264081	o	3.0	483891	e	2.0	-1.42	1.25 × 10 ⁰⁹	0.046
454.984	317400	o	0.0	537188	e	1.0	-1.82	4.74 × 10 ⁰⁸	0.008
455.226	320989	o	2.0	540660	e	2.0	-2.22	1.95 × 10 ⁰⁸	0.002
455.477	288053	o	3.0	507603	e	4.0	-1.36	1.44 × 10 ⁰⁹	0.076
455.884	285543	o	2.0	504897	e	1.0	-0.96	3.47 × 10 ⁰⁹	0.138
456.752	285543	o	2.0	504480	e	3.0	-2.00	3.22 × 10 ⁰⁸	0.182
457.160	323711	o	2.0	542453	e	1.0	-0.73	5.87 × 10 ⁰⁹	0.153
457.275	311985	o	2.0	530672	e	1.0	-1.87	4.36 × 10 ⁰⁸	0.029
457.492	323870	o	1.0	542453	e	1.0	-2.60	8.16 × 10 ⁰⁷	0.004
457.685	288053	o	3.0	506544	e	2.0	-1.10	2.44 × 10 ⁰⁹	0.042
458.184	322407	o	3.0	540660	e	2.0	-2.90	4.06 × 10 ⁰⁷	0.001
458.621	311985	o	2.0	530030	e	1.0	-1.25	1.79 × 10 ⁰⁹	0.059
458.766	262683	o	0.0	480659	e	1.0	-1.66	6.96 × 10 ⁰⁸	0.233
458.846	320989	o	2.0	538927	e	2.0	-2.77	5.35 × 10 ⁰⁷	0.002
459.379	312987	o	1.0	530672	e	1.0	-2.10	2.48 × 10 ⁰⁸	0.042
459.550	312987	o	1.0	530591	e	0.0	-1.28	1.64 × 10 ⁰⁹	0.124
459.686	263119	o	1.0	480659	e	1.0	-1.39	1.29 × 10 ⁰⁹	0.223
460.450	280850	o	3.0	498029	e	2.0	-1.32	1.53 × 10 ⁰⁹	0.033
460.738	312987	o	1.0	530030	e	1.0	-1.76	5.46 × 10 ⁰⁸	0.029
460.921	263702	o	2.0	480659	e	1.0	-2.77	5.36 × 10 ⁰⁷	0.005
460.938	323711	o	2.0	540660	e	2.0	-1.69	6.43 × 10 ⁰⁸	0.012
461.276	323870	o	1.0	540660	e	2.0	-1.41	1.29 × 10 ⁰⁹	0.013
461.719	275418	o	2.0	492000	e	1.0	-1.43	1.17 × 10 ⁰⁹	0.034
461.834	27176	e	2.0	243704	o	1.0	-0.26	1.72 × 10 ¹⁰	0.107
461.851	322407	o	3.0	538927	e	2.0	-1.45	1.09 × 10 ⁰⁹	0.055
462.050	288053	o	3.0	504480	e	3.0	-1.18	2.11 × 10 ⁰⁹	0.247
462.116	291472	o	4.0	507868	e	3.0	-0.57	8.50 × 10 ⁰⁹	0.094
462.417	285543	o	2.0	501798	e	3.0	-1.22	1.88 × 10 ⁰⁹	0.125
462.537	320989	o	2.0	537188	e	1.0	-1.70	6.21 × 10 ⁰⁸	0.008
462.682	291472	o	4.0	507603	e	4.0	-0.38	1.33 × 10 ¹⁰	0.230
463.706	311985	o	2.0	527639	e	2.0	-2.57	8.55 × 10 ⁰⁷	0.001
463.800	282419	o	1.0	498029	e	2.0	-1.48	1.02 × 10 ⁰⁹	0.069
463.828	289300	o	0.0	504897	e	1.0	-1.16	2.11 × 10 ⁰⁹	0.302
464.046	296679	o	3.0	512175	e	2.0	-1.65	7.03 × 10 ⁰⁸	0.082
464.649	323711	o	2.0	538927	e	2.0	-2.01	2.95 × 10 ⁰⁸	0.016
464.993	323870	o	1.0	538927	e	2.0	-5.07	2.66 × 10 ⁰⁵	0.000
465.870	312987	o	1.0	527639	e	2.0	-4.49	9.97 × 10 ⁰⁵	0.000
467.045	342695	o	1.0	556807	e	0.0	-2.56	8.67 × 10 ⁰⁷	0.003
467.847	288053	o	3.0	501798	e	3.0	-0.37	1.33 × 10 ¹⁰	0.248
468.393	320989	o	2.0	534485	e	3.0	-2.13	2.24 × 10 ⁰⁸	0.008
468.435	323711	o	2.0	537188	e	1.0	-1.19	1.94 × 10 ⁰⁹	0.023
468.784	323870	o	1.0	537188	e	1.0	-2.15	2.23 × 10 ⁰⁸	0.003
468.885	317400	o	0.0	530672	e	1.0	-2.04	2.71 × 10 ⁰⁸	0.026
469.466	291472	o	4.0	504480	e	3.0	-1.84	4.44 × 10 ⁰⁸	0.015
470.301	317400	o	0.0	530030	e	1.0	-1.48	9.86 × 10 ⁰⁸	0.075
470.619	285543	o	2.0	498029	e	2.0	-0.48	1.02 × 10 ¹⁰	0.227
470.845	328276	o	3.0	540660	e	2.0	-2.10	2.44 × 10 ⁰⁸	0.001
470.972	330126	o	2.0	542453	e	1.0	-0.74	5.38 × 10 ⁰⁹	0.236
471.067	311985	o	2.0	524269	e	2.0	-1.20	1.91 × 10 ⁰⁹	0.033
471.525	322407	o	3.0	534485	e	3.0	-1.26	1.66 × 10 ⁰⁹	0.047
472.608	345215	o	1.0	556807	e	0.0	-2.34	1.39 × 10 ⁰⁸	0.005
473.301	312987	o	1.0	524269	e	2.0	-2.57	8.06 × 10 ⁰⁷	0.002
473.510	296679	o	3.0	507868	e	3.0	-2.43	1.11 × 10 ⁰⁸	0.007

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
473.916	311985	o	2.0	522993	e	1.0	-1.69	6.18 × 10 ⁰⁸	0.007
474.104	296679	o	3.0	507603	e	4.0	-2.75	5.35 × 10 ⁰⁷	0.005
474.442	323711	o	2.0	534485	e	3.0	-2.21	1.84 × 10 ⁰⁸	0.013
474.719	328276	o	3.0	538927	e	2.0	-2.10	2.29 × 10 ⁰⁸	0.006
474.983	330126	o	2.0	540660	e	2.0	-0.64	6.81 × 10 ⁰⁹	0.056
475.452	291472	o	4.0	501798	e	3.0	-0.19	1.91 × 10 ¹⁰	0.231
476.177	312987	o	1.0	522993	e	1.0	-2.19	1.91 × 10 ⁰⁸	0.004
476.245	288053	o	3.0	498029	e	2.0	-0.52	9.05 × 10 ⁰⁹	0.147
476.497	296679	o	3.0	506544	e	2.0	-0.12	2.18 × 10 ¹⁰	0.467
476.910	320989	o	2.0	530672	e	1.0	-1.00	2.93 × 10 ⁰⁹	0.230
477.131	298282	o	4.0	507868	e	3.0	-0.06	2.56 × 10 ¹⁰	0.352
477.142	282419	o	1.0	492000	e	1.0	-0.99	3.03 × 10 ⁰⁹	0.248
477.149	324907	o	4.0	534485	e	3.0	0.17	4.27 × 10 ¹⁰	0.312
477.735	298282	o	4.0	507603	e	4.0	-4.19	1.89 × 10 ⁰⁶	0.000
478.375	320989	o	2.0	530030	e	1.0	-0.70	5.78 × 10 ⁰⁹	0.141
478.925	330126	o	2.0	538927	e	2.0	-2.12	2.16 × 10 ⁰⁸	0.016
479.678	275418	o	2.0	483891	e	2.0	-0.69	5.91 × 10 ⁰⁹	0.271
481.230	296679	o	3.0	504480	e	3.0	-2.74	5.35 × 10 ⁰⁷	0.020
482.947	330126	o	2.0	537188	e	1.0	-3.19	1.85 × 10 ⁰⁷	0.001
483.183	323711	o	2.0	530672	e	1.0	-1.60	7.22 × 10 ⁰⁸	0.076
483.365	300720	o	5.0	507603	e	4.0	0.23	4.89 × 10 ¹⁰	0.557
483.554	323870	o	1.0	530672	e	1.0	-1.45	1.05 × 10 ⁰⁹	0.047
483.744	323870	o	1.0	530591	e	0.0	-1.31	1.46 × 10 ⁰⁹	0.222
483.910	320989	o	2.0	527639	e	2.0	-2.52	8.71 × 10 ⁰⁷	0.001
484.362	285543	o	2.0	492000	e	1.0	-0.82	4.46 × 10 ⁰⁹	0.186
484.686	323711	o	2.0	530030	e	1.0	-2.62	6.72 × 10 ⁰⁷	0.004
484.945	328276	o	3.0	534485	e	3.0	-1.39	1.16 × 10 ⁰⁹	0.020
484.971	298282	o	4.0	504480	e	3.0	-1.14	2.06 × 10 ⁰⁹	0.155
485.023	56943	e	0.0	263119	o	1.0	-7.79	4.60 × 10 ⁰²	0.000
485.060	323870	o	1.0	530030	e	1.0	-1.25	1.67 × 10 ⁰⁹	0.091
486.398	317400	o	0.0	522993	e	1.0	-6.51	8.65 × 10 ⁰³	0.000
487.232	275418	o	2.0	480659	e	1.0	-0.27	1.51 × 10 ¹⁰	0.381
487.253	322407	o	3.0	527639	e	2.0	-0.24	1.64 × 10 ¹⁰	0.148
487.522	296679	o	3.0	501798	e	3.0	-2.62	6.78 × 10 ⁰⁷	0.003
489.163	303437	o	4.0	507868	e	3.0	-0.91	3.47 × 10 ⁰⁹	0.115
489.335	330126	o	2.0	534485	e	3.0	-2.10	2.21 × 10 ⁰⁸	0.007
489.798	303437	o	4.0	507603	e	4.0	-1.47	9.41 × 10 ⁰⁸	0.017
490.369	323711	o	2.0	527639	e	2.0	-1.59	7.16 × 10 ⁰⁸	0.007
490.752	323870	o	1.0	527639	e	2.0	-2.80	4.54 × 10 ⁰⁷	0.001
491.357	282419	o	1.0	485937	e	0.0	-0.69	5.60 × 10 ⁰⁹	0.463
491.362	298282	o	4.0	501798	e	3.0	-0.17	1.89 × 10 ¹⁰	0.229
491.932	320989	o	2.0	524269	e	2.0	-2.37	1.16 × 10 ⁰⁸	0.001
492.511	280850	o	3.0	483891	e	2.0	-0.15	1.93 × 10 ¹⁰	0.297
493.092	312987	o	1.0	515789	e	0.0	-1.23	1.62 × 10 ⁰⁹	0.210
493.340	289300	o	0.0	492000	e	1.0	-1.06	2.44 × 10 ⁰⁹	0.392
493.895	354335	o	1.0	556807	e	0.0	-2.37	1.17 × 10 ⁰⁸	0.005
495.040	320989	o	2.0	522993	e	1.0	-1.31	1.33 × 10 ⁰⁹	0.026
495.097	0	e	2.0	201981	o	1.0	-0.87	3.70 × 10 ⁰⁹	0.078
495.388	322407	o	3.0	524269	e	2.0	-1.03	2.53 × 10 ⁰⁹	0.041
496.347	282419	o	1.0	483891	e	2.0	-2.04	2.48 × 10 ⁰⁸	0.071
496.648	296679	o	3.0	498029	e	2.0	-0.37	1.18 × 10 ¹⁰	0.225
497.406	303437	o	4.0	504480	e	3.0	0.12	3.55 × 10 ¹⁰	0.522
498.609	323711	o	2.0	524269	e	2.0	-1.01	2.62 × 10 ⁰⁹	0.040
498.639	330126	o	2.0	530672	e	1.0	-0.47	9.11 × 10 ⁰⁹	0.351
499.004	323870	o	1.0	524269	e	2.0	-2.17	1.89 × 10 ⁰⁸	0.005

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
499.525	311985	o	2.0	512175	e	2.0	-4.47	9.16×10^{05}	0.000
500.240	330126	o	2.0	530030	e	1.0	-2.70	5.30×10^{07}	0.003
500.606	342695	o	1.0	542453	e	1.0	-2.61	6.54×10^{07}	0.009
501.598	328276	o	3.0	527639	e	2.0	-1.81	4.17×10^{08}	0.008
501.801	323711	o	2.0	522993	e	1.0	-0.76	4.67×10^{09}	0.059
502.038	312987	o	1.0	512175	e	2.0	-2.75	4.68×10^{07}	0.009
502.202	323870	o	1.0	522993	e	1.0	-2.49	8.97×10^{07}	0.003
503.461	343828	o	2.0	542453	e	1.0	-5.33	1.20×10^{05}	0.000
504.131	303437	o	4.0	501798	e	3.0	-3.04	2.41×10^{07}	0.001
504.164	285543	o	2.0	483891	e	2.0	-1.45	9.48×10^{08}	0.087
504.439	282419	o	1.0	480659	e	1.0	-1.12	1.98×10^{09}	0.108
505.140	342695	o	1.0	540660	e	2.0	-1.26	1.48×10^{09}	0.022
506.296	330126	o	2.0	527639	e	2.0	-1.64	5.99×10^{08}	0.016
507.002	345215	o	1.0	542453	e	1.0	-2.24	1.49×10^{08}	0.006
508.047	343828	o	2.0	540660	e	2.0	-1.70	5.16×10^{08}	0.006
509.601	342695	o	1.0	538927	e	2.0	-2.65	5.81×10^{07}	0.013
510.222	328276	o	3.0	524269	e	2.0	-0.63	5.95×10^{09}	0.134
510.509	311985	o	2.0	507868	e	3.0	-1.73	4.78×10^{08}	0.063
510.626	288053	o	3.0	483891	e	2.0	-0.93	3.02×10^{09}	0.131
511.653	345215	o	1.0	540660	e	2.0	-4.91	3.22×10^{05}	0.000
512.516	285543	o	2.0	480659	e	1.0	-1.31	1.26×10^{09}	0.055
512.560	343828	o	2.0	538927	e	2.0	-2.00	2.47×10^{08}	0.031
512.587	13549	e	1.0	208638	o	0.0	-1.03	2.38×10^{09}	0.076
513.983	311985	o	2.0	506544	e	2.0	-3.13	1.82×10^{07}	0.002
514.157	342695	o	1.0	537188	e	1.0	-2.95	2.90×10^{07}	0.002
514.938	346462	o	3.0	540660	e	2.0	-0.44	9.39×10^{09}	0.140
515.084	330126	o	2.0	524269	e	2.0	-3.16	1.75×10^{07}	0.001
516.230	345215	o	1.0	538927	e	2.0	-1.86	3.40×10^{08}	0.017
516.644	312987	o	1.0	506544	e	2.0	-1.73	4.43×10^{08}	0.044
517.170	343828	o	2.0	537188	e	1.0	-4.44	8.96×10^{05}	0.000
518.371	311985	o	2.0	504897	e	1.0	-0.74	4.50×10^{09}	0.323
518.492	330126	o	2.0	522993	e	1.0	-2.40	1.00×10^{08}	0.006
518.639	0	e	2.0	192812	o	2.0	-0.49	8.09×10^{09}	0.077
519.494	311985	o	2.0	504480	e	3.0	-1.76	4.41×10^{08}	0.054
519.575	346462	o	3.0	538927	e	2.0	-0.63	5.73×10^{09}	0.097
520.907	345215	o	1.0	537188	e	1.0	-2.27	1.34×10^{08}	0.003
521.053	323870	o	1.0	515789	e	0.0	-1.09	2.05×10^{09}	0.318
521.078	312987	o	1.0	504897	e	1.0	-1.22	1.46×10^{09}	0.178
521.078	364897	o	1.0	556807	e	0.0	-2.26	1.35×10^{08}	0.006
522.578	289300	o	0.0	480659	e	1.0	-2.47	8.18×10^{07}	0.057
523.051	320989	o	2.0	512175	e	2.0	-2.85	3.47×10^{07}	0.002
524.502	343828	o	2.0	534485	e	3.0	-2.62	5.73×10^{07}	0.003
526.834	311985	o	2.0	501798	e	3.0	-1.92	2.93×10^{08}	0.071
526.959	322407	o	3.0	512175	e	2.0	-2.13	1.80×10^{08}	0.028
527.918	12557	e	0.0	201981	o	1.0	-1.03	2.22×10^{09}	0.079
530.605	323711	o	2.0	512175	e	2.0	-2.60	5.97×10^{07}	0.006
530.697	13549	e	1.0	201981	o	1.0	-1.16	1.65×10^{09}	0.076
531.053	323870	o	1.0	512175	e	2.0	-2.59	6.43×10^{07}	0.006
531.581	354335	o	1.0	542453	e	1.0	-5.99	2.35×10^{04}	0.000
531.850	346462	o	3.0	534485	e	3.0	-0.91	2.97×10^{09}	0.097
531.980	342695	o	1.0	530672	e	1.0	-1.51	7.51×10^{08}	0.097
532.209	342695	o	1.0	530591	e	0.0	-3.48	7.92×10^{06}	0.004
532.462	352853	o	3.0	540660	e	2.0	-1.15	1.69×10^{09}	0.015
533.342	317400	o	0.0	504897	e	1.0	-1.87	3.05×10^{08}	0.080
533.803	342695	o	1.0	530030	e	1.0	-2.62	5.74×10^{07}	0.008

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
534.154	296679	o	3.0	483891	e	2.0	-1.60	6.00 × 10 ⁰⁸	0.156
535.106	320989	o	2.0	507868	e	3.0	-2.22	1.41 × 10 ⁰⁸	0.010
535.206	343828	o	2.0	530672	e	1.0	-1.96	2.54 × 10 ⁰⁸	0.024
535.323	355650	o	0.0	542453	e	1.0	-2.52	6.92 × 10 ⁰⁷	0.006
535.444	56943	e	0.0	243704	o	1.0	-1.02	2.23 × 10 ⁰⁹	0.106
536.697	354335	o	1.0	540660	e	2.0	-1.72	4.46 × 10 ⁰⁸	0.007
537.051	343828	o	2.0	530030	e	1.0	-2.33	1.06 × 10 ⁰⁸	0.013
537.421	352853	o	3.0	538927	e	2.0	-1.67	4.85 × 10 ⁰⁸	0.025
537.507	311985	o	2.0	498029	e	2.0	-1.89	3.01 × 10 ⁰⁸	0.041
538.924	320989	o	2.0	506544	e	2.0	-0.95	2.45 × 10 ⁰⁹	0.142
539.197	322407	o	3.0	507868	e	3.0	-1.91	2.83 × 10 ⁰⁸	0.023
539.209	345215	o	1.0	530672	e	1.0	-1.97	2.46 × 10 ⁰⁸	0.027
539.444	345215	o	1.0	530591	e	0.0	-2.01	2.25 × 10 ⁰⁸	0.083
539.968	322407	o	3.0	507603	e	4.0	-3.51	7.17 × 10 ⁰⁶	0.001
540.418	312987	o	1.0	498029	e	2.0	-1.55	6.46 × 10 ⁰⁸	0.060
540.704	342695	o	1.0	527639	e	2.0	-2.32	1.11 × 10 ⁰⁸	0.014
541.082	345215	o	1.0	530030	e	1.0	-3.01	2.23 × 10 ⁰⁷	0.002
541.735	354335	o	1.0	538927	e	2.0	-1.86	3.07 × 10 ⁰⁸	0.024
543.015	323711	o	2.0	507868	e	3.0	-1.85	3.19 × 10 ⁰⁸	0.049
543.074	322407	o	3.0	506544	e	2.0	-1.90	2.69 × 10 ⁰⁸	0.017
543.750	320989	o	2.0	504897	e	1.0	-1.82	3.38 × 10 ⁰⁸	0.042
543.777	328276	o	3.0	512175	e	2.0	-2.62	5.46 × 10 ⁰⁷	0.002
544.037	343828	o	2.0	527639	e	2.0	-2.34	1.03 × 10 ⁰⁸	0.006
544.986	320989	o	2.0	504480	e	3.0	-2.46	7.78 × 10 ⁰⁷	0.026
546.565	324907	o	4.0	507868	e	3.0	-1.53	6.58 × 10 ⁰⁸	0.033
546.887	354335	o	1.0	537188	e	1.0	-2.31	1.09 × 10 ⁰⁸	0.002
546.947	323711	o	2.0	506544	e	2.0	-1.34	9.71 × 10 ⁰⁸	0.059
547.357	324907	o	4.0	507603	e	4.0	-1.09	1.83 × 10 ⁰⁹	0.084
547.423	323870	o	1.0	506544	e	2.0	-1.64	5.07 × 10 ⁰⁸	0.081
548.173	345215	o	1.0	527639	e	2.0	-2.81	3.52 × 10 ⁰⁷	0.001
548.619	360177	o	2.0	542453	e	1.0	-3.69	4.46 × 10 ⁰⁶	0.000
549.230	322407	o	3.0	504480	e	3.0	-1.66	4.91 × 10 ⁰⁸	0.196
549.303	330126	o	2.0	512175	e	2.0	-1.54	6.34 × 10 ⁰⁸	0.059
550.564	352853	o	3.0	534485	e	3.0	-1.34	9.96 × 10 ⁰⁸	0.025
550.740	342695	o	1.0	524269	e	2.0	-1.36	9.87 × 10 ⁰⁸	0.080
550.849	355650	o	0.0	537188	e	1.0	-3.07	1.89 × 10 ⁰⁷	0.001
551.919	323711	o	2.0	504897	e	1.0	-1.68	4.44 × 10 ⁰⁸	0.027
551.946	346462	o	3.0	527639	e	2.0	-3.59	5.80 × 10 ⁰⁶	0.000
552.404	323870	o	1.0	504897	e	1.0	-1.24	1.29 × 10 ⁰⁹	0.257
553.070	320989	o	2.0	501798	e	3.0	-2.03	2.05 × 10 ⁰⁸	0.017
553.192	323711	o	2.0	504480	e	3.0	-2.57	5.93 × 10 ⁰⁷	0.044
554.069	360177	o	2.0	540660	e	2.0	-1.30	1.12 × 10 ⁰⁹	0.016
554.198	343828	o	2.0	524269	e	2.0	-2.09	1.73 × 10 ⁰⁸	0.007
554.637	342695	o	1.0	522993	e	1.0	-3.16	1.57 × 10 ⁰⁷	0.003
555.509	311985	o	2.0	492000	e	1.0	-1.09	1.82 × 10 ⁰⁹	0.128
556.818	328276	o	3.0	507868	e	3.0	-0.64	4.89 × 10 ⁰⁹	0.217
556.877	324907	o	4.0	504480	e	3.0	-4.48	7.13 × 10 ⁰⁵	0.000
557.442	322407	o	3.0	501798	e	3.0	-1.34	9.89 × 10 ⁰⁸	0.059
557.641	328276	o	3.0	507603	e	4.0	-2.12	1.65 × 10 ⁰⁸	0.004
557.839	13549	e	1.0	192812	o	2.0	-0.92	2.57 × 10 ⁰⁹	0.081
558.145	343828	o	2.0	522993	e	1.0	-3.72	4.09 × 10 ⁰⁶	0.001
558.491	345215	o	1.0	524269	e	2.0	-1.52	6.46 × 10 ⁰⁸	0.021
558.619	312987	o	1.0	492000	e	1.0	-1.20	1.39 × 10 ⁰⁹	0.160
559.441	360177	o	2.0	538927	e	2.0	-2.05	1.86 × 10 ⁰⁸	0.009
560.953	328276	o	3.0	506544	e	2.0	-1.78	3.34 × 10 ⁰⁸	0.024

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
561.523	323711	o	2.0	501798	e	3.0	-3.26	1.15 × 10 ⁰⁷	0.002
562.408	346462	o	3.0	524269	e	2.0	-0.92	2.56 × 10 ⁰⁹	0.072
562.499	345215	o	1.0	522993	e	1.0	-1.82	3.25 × 10 ⁰⁸	0.007
562.613	330126	o	2.0	507868	e	3.0	-6.73	3.94 × 10 ⁰³	0.000
563.203	364897	o	1.0	542453	e	1.0	-1.68	4.33 × 10 ⁰⁸	0.029
564.844	320989	o	2.0	498029	e	2.0	-1.19	1.36 × 10 ⁰⁹	0.073
564.937	360177	o	2.0	537188	e	1.0	-3.64	4.79 × 10 ⁰⁶	0.000
565.320	324907	o	4.0	501798	e	3.0	-3.32	1.00 × 10 ⁰⁷	0.000
566.836	330126	o	2.0	506544	e	2.0	-4.24	1.15 × 10 ⁰⁶	0.000
567.096	354335	o	1.0	530672	e	1.0	-0.89	2.65 × 10 ⁰⁹	0.227
567.357	354335	o	1.0	530591	e	0.0	-1.64	4.77 × 10 ⁰⁸	0.160
567.524	328276	o	3.0	504480	e	3.0	-3.44	7.51 × 10 ⁰⁶	0.001
568.948	364897	o	1.0	540660	e	2.0	-1.87	2.85 × 10 ⁰⁸	0.025
569.168	354335	o	1.0	530030	e	1.0	-1.34	9.35 × 10 ⁰⁸	0.087
569.405	322407	o	3.0	498029	e	2.0	-4.95	2.35 × 10 ⁰⁵	0.000
571.357	355650	o	0.0	530672	e	1.0	-1.27	1.09 × 10 ⁰⁹	0.171
572.068	27176	e	2.0	201981	o	1.0	-2.76	3.54 × 10 ⁰⁷	0.004
572.128	352853	o	3.0	527639	e	2.0	-2.99	2.10 × 10 ⁰⁷	0.001
572.177	330126	o	2.0	504897	e	1.0	-4.41	7.80 × 10 ⁰⁵	0.000
572.738	317400	o	0.0	492000	e	1.0	-1.80	3.20 × 10 ⁰⁸	0.079
573.460	355650	o	0.0	530030	e	1.0	-1.33	9.59 × 10 ⁰⁸	0.124
573.546	330126	o	2.0	504480	e	3.0	-5.31	9.98 × 10 ⁰⁴	0.000
573.664	323711	o	2.0	498029	e	2.0	-2.80	3.26 × 10 ⁰⁷	0.002
573.697	360177	o	2.0	534485	e	3.0	-1.51	6.22 × 10 ⁰⁸	0.029
574.188	323870	o	1.0	498029	e	2.0	-1.89	2.71 × 10 ⁰⁸	0.051
574.614	364897	o	1.0	538927	e	2.0	-2.64	4.58 × 10 ⁰⁷	0.007
576.296	328276	o	3.0	501798	e	3.0	-1.29	1.04 × 10 ⁰⁹	0.066
577.021	354335	o	1.0	527639	e	2.0	-2.61	4.93 × 10 ⁰⁷	0.002
577.721	342695	o	1.0	515789	e	0.0	-2.10	1.62 × 10 ⁰⁸	0.026
578.202	312987	o	1.0	485937	e	0.0	-1.40	7.75 × 10 ⁰⁸	0.133
580.413	364897	o	1.0	537188	e	1.0	-2.29	1.03 × 10 ⁰⁸	0.004
581.713	311985	o	2.0	483891	e	2.0	-3.71	3.89 × 10 ⁰⁶	0.001
582.506	330126	o	2.0	501798	e	3.0	-2.83	2.92 × 10 ⁰⁷	0.006
583.376	352853	o	3.0	524269	e	2.0	-1.42	7.35 × 10 ⁰⁸	0.027
584.515	371371	o	2.0	542453	e	1.0	-0.68	4.04 × 10 ⁰⁹	0.181
584.758	320989	o	2.0	492000	e	1.0	-1.39	8.17 × 10 ⁰⁸	0.078
585.124	312987	o	1.0	483891	e	2.0	-2.45	6.93 × 10 ⁰⁷	0.035
586.256	345215	o	1.0	515789	e	0.0	-1.72	3.69 × 10 ⁰⁸	0.048
586.527	360177	o	2.0	530672	e	1.0	-2.31	9.48 × 10 ⁰⁷	0.011
588.464	354335	o	1.0	524269	e	2.0	-1.53	5.65 × 10 ⁰⁸	0.020
588.744	360177	o	2.0	530030	e	1.0	-0.56	5.27 × 10 ⁰⁹	0.250
589.091	328276	o	3.0	498029	e	2.0	-1.78	3.20 × 10 ⁰⁸	0.026
590.040	342695	o	1.0	512175	e	2.0	-0.60	5.00 × 10 ⁰⁹	0.397
590.706	371371	o	2.0	540660	e	2.0	-0.89	2.48 × 10 ⁰⁹	0.079
592.860	311985	o	2.0	480659	e	1.0	-2.92	2.32 × 10 ⁰⁷	0.003
592.916	354335	o	1.0	522993	e	1.0	-1.78	3.16 × 10 ⁰⁸	0.010
594.011	343828	o	2.0	512175	e	2.0	-0.44	6.93 × 10 ⁰⁹	0.343
594.216	323711	o	2.0	492000	e	1.0	-2.87	2.63 × 10 ⁰⁷	0.002
594.778	323870	o	1.0	492000	e	1.0	-1.92	2.41 × 10 ⁰⁸	0.039
595.582	330126	o	2.0	498029	e	2.0	-3.75	3.32 × 10 ⁰⁶	0.001
596.403	312987	o	1.0	480659	e	1.0	-1.32	9.00 × 10 ⁰⁸	0.084
596.815	371371	o	2.0	538927	e	2.0	-0.67	3.96 × 10 ⁰⁹	0.183
597.150	360177	o	2.0	527639	e	2.0	-1.51	5.77 × 10 ⁰⁸	0.010
597.575	355650	o	0.0	522993	e	1.0	-2.03	1.77 × 10 ⁰⁸	0.011
598.946	345215	o	1.0	512175	e	2.0	-1.24	1.09 × 10 ⁰⁹	0.113

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
603.074	371371	o	2.0	537188	e	1.0	-3.59	4.68 × 10 ⁰⁶	0.000
603.227	364897	o	1.0	530672	e	1.0	-2.81	2.82 × 10 ⁰⁷	0.011
603.453	346462	o	3.0	512175	e	2.0	-1.97	2.02 × 10 ⁰⁸	0.021
603.522	364897	o	1.0	530591	e	0.0	-0.79	2.98 × 10 ⁰⁹	0.391
603.733	27176	e	2.0	192812	o	2.0	-1.49	5.91 × 10 ⁰⁸	0.084
605.572	364897	o	1.0	530030	e	1.0	-1.09	1.48 × 10 ⁰⁹	0.162
609.414	360177	o	2.0	524269	e	2.0	-1.04	1.64 × 10 ⁰⁹	0.034
609.607	343828	o	2.0	507868	e	3.0	-0.99	1.83 × 10 ⁰⁹	0.166
610.318	342695	o	1.0	506544	e	2.0	-3.75	3.12 × 10 ⁰⁶	0.001
612.524	317400	o	0.0	480659	e	1.0	-3.62	4.18 × 10 ⁰⁶	0.001
613.068	371371	o	2.0	534485	e	3.0	-2.02	1.68 × 10 ⁰⁸	0.014
613.866	320989	o	2.0	483891	e	2.0	-1.67	3.80 × 10 ⁰⁸	0.036
614.190	360177	o	2.0	522993	e	1.0	-1.93	2.12 × 10 ⁰⁸	0.009
614.470	364897	o	1.0	527639	e	2.0	-1.27	9.52 × 10 ⁰⁸	0.018
614.568	343828	o	2.0	506544	e	2.0	-1.44	6.05 × 10 ⁰⁸	0.102
616.515	342695	o	1.0	504897	e	1.0	-2.59	4.56 × 10 ⁰⁷	0.063
617.029	323870	o	1.0	485937	e	0.0	-2.90	2.28 × 10 ⁰⁷	0.010
617.764	330126	o	2.0	492000	e	1.0	-2.71	3.46 × 10 ⁰⁷	0.006
619.256	322407	o	3.0	483891	e	2.0	-2.47	5.90 × 10 ⁰⁷	0.016
619.371	354335	o	1.0	515789	e	0.0	-1.16	1.19 × 10 ⁰⁹	0.208
619.556	346462	o	3.0	507868	e	3.0	-6.24	1.01 × 10 ⁰⁴	0.000
619.851	345215	o	1.0	506544	e	2.0	-2.29	8.58 × 10 ⁰⁷	0.021
620.575	346462	o	3.0	507603	e	4.0	-2.27	9.50 × 10 ⁰⁷	0.002
620.852	343828	o	2.0	504897	e	1.0	-2.49	5.43 × 10 ⁰⁷	0.042
622.463	343828	o	2.0	504480	e	3.0	-1.44	6.17 × 10 ⁰⁸	0.205
623.830	380360	o	3.0	540660	e	2.0	-1.45	6.13 × 10 ⁰⁸	0.024
624.298	323711	o	2.0	483891	e	2.0	-2.26	9.47 × 10 ⁰⁷	0.021
624.680	346462	o	3.0	506544	e	2.0	-2.01	1.59 × 10 ⁰⁸	0.017
624.918	323870	o	1.0	483891	e	2.0	-2.48	5.94 × 10 ⁰⁷	0.008
626.245	345215	o	1.0	504897	e	1.0	-1.27	9.00 × 10 ⁰⁸	0.105
626.292	320989	o	2.0	480659	e	1.0	-1.92	2.07 × 10 ⁰⁸	0.012
627.660	352853	o	3.0	512175	e	2.0	-0.28	8.90 × 10 ⁰⁹	0.367
627.742	371371	o	2.0	530672	e	1.0	-1.36	7.36 × 10 ⁰⁸	0.166
629.644	397987	o	1.0	556807	e	0.0	-0.68	3.56 × 10 ⁰⁹	0.218
630.283	371371	o	2.0	530030	e	1.0	-2.58	4.36 × 10 ⁰⁷	0.004
630.648	380360	o	3.0	538927	e	2.0	-0.17	1.11 × 10 ¹⁰	0.315
632.527	364897	o	1.0	522993	e	1.0	-1.23	1.00 × 10 ⁰⁹	0.049
632.839	346462	o	3.0	504480	e	3.0	-1.57	4.58 × 10 ⁰⁸	0.053
633.032	343828	o	2.0	501798	e	3.0	-1.32	7.87 × 10 ⁰⁸	0.117
633.553	354335	o	1.0	512175	e	2.0	-1.66	3.63 × 10 ⁰⁸	0.041
637.154	323711	o	2.0	480659	e	1.0	-2.47	5.53 × 10 ⁰⁷	0.006
637.800	323870	o	1.0	480659	e	1.0	-2.50	5.49 × 10 ⁰⁷	0.007
639.926	371371	o	2.0	527639	e	2.0	-4.50	5.24 × 10 ⁰⁵	0.000
642.612	328276	o	3.0	483891	e	2.0	-1.14	1.17 × 10 ⁰⁹	0.053
643.766	346462	o	3.0	501798	e	3.0	-2.97	1.74 × 10 ⁰⁷	0.003
643.774	342695	o	1.0	498029	e	2.0	-1.73	3.14 × 10 ⁰⁸	0.161
645.099	352853	o	3.0	507868	e	3.0	-1.51	4.93 × 10 ⁰⁸	0.042
646.204	352853	o	3.0	507603	e	4.0	-1.45	5.66 × 10 ⁰⁸	0.027
648.504	343828	o	2.0	498029	e	2.0	-2.51	4.91 × 10 ⁰⁷	0.010
648.824	380360	o	3.0	534485	e	3.0	-1.13	1.17 × 10 ⁰⁹	0.091
650.343	330126	o	2.0	483891	e	2.0	-2.61	3.92 × 10 ⁰⁷	0.005
650.656	352853	o	3.0	506544	e	2.0	-1.48	4.94 × 10 ⁰⁸	0.098
654.031	371371	o	2.0	524269	e	2.0	-1.05	1.39 × 10 ⁰⁹	0.045
654.390	345215	o	1.0	498029	e	2.0	-2.07	1.36 × 10 ⁰⁸	0.040
656.991	354335	o	1.0	506544	e	2.0	-2.10	1.16 × 10 ⁰⁸	0.028

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
657.903	360177	o	2.0	512175	e	2.0	-1.19	1.01 × 10 ⁰⁹	0.080
659.513	352853	o	3.0	504480	e	3.0	-0.89	1.99 × 10 ⁰⁹	0.274
659.535	371371	o	2.0	522993	e	1.0	-1.46	5.35 × 10 ⁰⁸	0.022
659.774	346462	o	3.0	498029	e	2.0	-2.61	3.86 × 10 ⁰⁷	0.006
662.726	364897	o	1.0	515789	e	0.0	-1.55	4.29 × 10 ⁰⁸	0.110
664.178	354335	o	1.0	504897	e	1.0	-1.42	5.68 × 10 ⁰⁸	0.102
664.306	330126	o	2.0	480659	e	1.0	-2.36	6.55 × 10 ⁰⁷	0.009
669.770	342695	o	1.0	492000	e	1.0	-2.05	1.39 × 10 ⁰⁸	0.084
670.030	355650	o	0.0	504897	e	1.0	-1.92	1.78 × 10 ⁰⁸	0.080
671.389	352853	o	3.0	501798	e	3.0	-3.13	1.10 × 10 ⁰⁷	0.001
674.891	343828	o	2.0	492000	e	1.0	-1.77	2.55 × 10 ⁰⁸	0.095
677.089	360177	o	2.0	507868	e	3.0	-2.46	5.00 × 10 ⁰⁷	0.006
678.983	380360	o	3.0	527639	e	2.0	-1.89	1.89 × 10 ⁰⁸	0.008
678.988	364897	o	1.0	512175	e	2.0	-2.29	7.59 × 10 ⁰⁷	0.035
681.269	345215	o	1.0	492000	e	1.0	-1.24	8.61 × 10 ⁰⁸	0.098
683.214	360177	o	2.0	506544	e	2.0	-1.87	1.82 × 10 ⁰⁸	0.025
688.819	352853	o	3.0	498029	e	2.0	-1.29	7.29 × 10 ⁰⁸	0.105
689.477	56943	e	0.0	201981	o	1.0	-2.49	4.56 × 10 ⁰⁷	0.012
690.989	360177	o	2.0	504897	e	1.0	-3.31	6.65 × 10 ⁰⁶	0.001
692.204	397987	o	1.0	542453	e	1.0	-0.90	1.75 × 10 ⁰⁹	0.237
692.986	360177	o	2.0	504480	e	3.0	-1.75	2.49 × 10 ⁰⁸	0.081
694.884	380360	o	3.0	524269	e	2.0	-0.79	2.25 × 10 ⁰⁹	0.108
695.923	354335	o	1.0	498029	e	2.0	-1.97	1.50 × 10 ⁰⁸	0.042
698.119	342695	o	1.0	485937	e	0.0	-3.31	6.79 × 10 ⁰⁶	0.005
700.903	397987	o	1.0	540660	e	2.0	-2.97	1.50 × 10 ⁰⁷	0.002
705.980	364897	o	1.0	506544	e	2.0	-3.68	2.63 × 10 ⁰⁶	0.001
706.110	360177	o	2.0	501798	e	3.0	-2.72	2.58 × 10 ⁰⁷	0.004
708.235	342695	o	1.0	483891	e	2.0	-1.77	2.36 × 10 ⁰⁸	0.029
709.522	397987	o	1.0	538927	e	2.0	-2.35	5.91 × 10 ⁰⁷	0.011
710.207	371371	o	2.0	512175	e	2.0	-4.25	7.55 × 10 ⁰⁵	0.000
710.621	345215	o	1.0	485937	e	0.0	-2.08	1.09 × 10 ⁰⁸	0.086
713.964	343828	o	2.0	483891	e	2.0	-1.93	1.55 × 10 ⁰⁸	0.014
718.386	397987	o	1.0	537188	e	1.0	-5.59	3.34 × 10 ⁰⁴	0.000
721.105	345215	o	1.0	483891	e	2.0	-4.13	9.80 × 10 ⁰⁵	0.000
722.376	418375	o	1.0	556807	e	0.0	-3.50	4.09 × 10 ⁰⁶	0.001
724.827	342695	o	1.0	480659	e	1.0	-2.24	7.57 × 10 ⁰⁷	0.017
725.416	360177	o	2.0	498029	e	2.0	-2.49	4.19 × 10 ⁰⁷	0.005
726.401	354335	o	1.0	492000	e	1.0	-2.03	1.21 × 10 ⁰⁸	0.021
727.648	346462	o	3.0	483891	e	2.0	-2.10	1.02 × 10 ⁰⁸	0.022
730.829	343828	o	2.0	480659	e	1.0	-1.57	3.34 × 10 ⁰⁸	0.064
732.617	371371	o	2.0	507868	e	3.0	-2.37	5.25 × 10 ⁰⁷	0.020
733.407	355650	o	0.0	492000	e	1.0	-1.97	1.38 × 10 ⁰⁸	0.056
738.313	345215	o	1.0	480659	e	1.0	-1.73	2.30 × 10 ⁰⁸	0.052
739.793	371371	o	2.0	506544	e	2.0	-2.51	3.51 × 10 ⁰⁷	0.014
748.066	408775	o	2.0	542453	e	1.0	-3.23	6.95 × 10 ⁰⁶	0.004
748.918	371371	o	2.0	504897	e	1.0	-1.52	3.53 × 10 ⁰⁸	0.069
751.134	364897	o	1.0	498029	e	2.0	-2.36	5.28 × 10 ⁰⁷	0.014
751.264	371371	o	2.0	504480	e	3.0	-1.73	2.24 × 10 ⁰⁸	0.066
753.665	397987	o	1.0	530672	e	1.0	-1.99	1.22 × 10 ⁰⁸	0.105
754.125	397987	o	1.0	530591	e	0.0	-3.53	3.49 × 10 ⁰⁶	0.002
757.329	397987	o	1.0	530030	e	1.0	-1.63	2.75 × 10 ⁰⁸	0.082
758.236	408775	o	2.0	540660	e	2.0	-2.83	1.74 × 10 ⁰⁷	0.003
758.593	360177	o	2.0	492000	e	1.0	-1.28	6.29 × 10 ⁰⁸	0.084
758.639	380360	o	3.0	512175	e	2.0	-2.38	4.89 × 10 ⁰⁷	0.009
759.867	354335	o	1.0	485937	e	0.0	-2.40	4.52 × 10 ⁰⁷	0.041

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
763.137	352853	o	3.0	483891	e	2.0	-0.71	2.26 × 10 ⁰⁹	0.104
766.712	371371	o	2.0	501798	e	3.0	-2.23	6.68 × 10 ⁰⁷	0.037
768.332	408775	o	2.0	538927	e	2.0	-4.08	9.18 × 10 ⁰⁵	0.001
771.295	397987	o	1.0	527639	e	2.0	-3.17	7.65 × 10 ⁰⁶	0.001
771.867	354335	o	1.0	483891	e	2.0	-2.69	2.32 × 10 ⁰⁷	0.005
778.737	408775	o	2.0	537188	e	1.0	-4.32	5.30 × 10 ⁰⁵	0.006
784.265	380360	o	3.0	507868	e	3.0	-1.51	3.32 × 10 ⁰⁸	0.128
785.898	380360	o	3.0	507603	e	4.0	-2.04	1.00 × 10 ⁰⁸	0.005
786.763	364897	o	1.0	492000	e	1.0	-4.12	8.53 × 10 ⁰⁵	0.000
789.528	371371	o	2.0	498029	e	2.0	-4.75	1.94 × 10 ⁰⁵	0.000
791.615	354335	o	1.0	480659	e	1.0	-2.87	1.44 × 10 ⁰⁷	0.004
791.878	397987	o	1.0	524269	e	2.0	-3.08	8.94 × 10 ⁰⁶	0.002
792.494	380360	o	3.0	506544	e	2.0	-2.20	6.26 × 10 ⁰⁷	0.038
795.482	408775	o	2.0	534485	e	3.0	-3.02	1.00 × 10 ⁰⁷	0.001
799.942	355650	o	0.0	480659	e	1.0	-2.62	2.55 × 10 ⁰⁷	0.007
799.962	397987	o	1.0	522993	e	1.0	-1.91	1.32 × 10 ⁰⁸	0.017
805.672	380360	o	3.0	504480	e	3.0	-1.00	1.04 × 10 ⁰⁹	0.135
805.945	418375	o	1.0	542453	e	1.0	-4.26	5.49 × 10 ⁰⁵	0.000
808.316	360177	o	2.0	483891	e	2.0	-1.55	2.89 × 10 ⁰⁸	0.040
817.762	418375	o	1.0	540660	e	2.0	-2.18	6.74 × 10 ⁰⁷	0.026
819.726	434815	o	1.0	556807	e	0.0	-2.69	2.01 × 10 ⁰⁷	0.005
820.365	408775	o	2.0	530672	e	1.0	-2.67	2.13 × 10 ⁰⁷	0.006
823.465	380360	o	3.0	501798	e	3.0	-2.28	5.11 × 10 ⁰⁷	0.045
824.708	408775	o	2.0	530030	e	1.0	-2.89	1.26 × 10 ⁰⁷	0.004
826.173	364897	o	1.0	485937	e	0.0	-1.39	3.88 × 10 ⁰⁸	0.106
828.988	371371	o	2.0	492000	e	1.0	-2.95	1.14 × 10 ⁰⁷	0.002
829.518	418375	o	1.0	538927	e	2.0	-3.11	7.32 × 10 ⁰⁶	0.001
830.000	360177	o	2.0	480659	e	1.0	-1.46	3.33 × 10 ⁰⁸	0.031
840.379	364897	o	1.0	483891	e	2.0	-2.59	2.44 × 10 ⁰⁷	0.027
841.298	408775	o	2.0	527639	e	2.0	-4.95	1.06 × 10 ⁰⁵	0.000
841.659	418375	o	1.0	537188	e	1.0	-3.80	1.49 × 10 ⁰⁶	0.011
848.882	397987	o	1.0	515789	e	0.0	-2.42	3.54 × 10 ⁰⁷	0.016
849.842	380360	o	3.0	498029	e	2.0	-3.23	5.46 × 10 ⁰⁶	0.004
863.841	364897	o	1.0	480659	e	1.0	-1.63	2.10 × 10 ⁰⁸	0.044
865.846	408775	o	2.0	524269	e	2.0	-2.64	2.05 × 10 ⁰⁷	0.013
875.519	408775	o	2.0	522993	e	1.0	-5.44	3.22 × 10 ⁰⁴	0.000
875.749	397987	o	1.0	512175	e	2.0	-3.32	4.29 × 10 ⁰⁶	0.005
888.731	371371	o	2.0	483891	e	2.0	-2.45	3.00 × 10 ⁰⁷	0.016
890.496	418375	o	1.0	530672	e	1.0	-2.54	2.43 × 10 ⁰⁷	0.010
891.139	418375	o	1.0	530591	e	0.0	-2.11	6.52 × 10 ⁰⁷	0.027
895.616	418375	o	1.0	530030	e	1.0	-1.40	3.33 × 10 ⁰⁸	0.082
915.014	371371	o	2.0	480659	e	1.0	-2.07	6.80 × 10 ⁰⁷	0.019
915.215	418375	o	1.0	527639	e	2.0	-2.64	1.86 × 10 ⁰⁷	0.006
921.175	397987	o	1.0	506544	e	2.0	-4.74	1.33 × 10 ⁰⁵	0.000
928.617	434766	o	2.0	542453	e	1.0	-2.64	1.74 × 10 ⁰⁷	0.002
929.040	434815	o	1.0	542453	e	1.0	-3.30	3.79 × 10 ⁰⁶	0.000
935.366	397987	o	1.0	504897	e	1.0	-3.15	5.35 × 10 ⁰⁶	0.006
944.341	418375	o	1.0	524269	e	2.0	-2.37	3.19 × 10 ⁰⁷	0.026
944.341	434766	o	2.0	540660	e	2.0	-2.20	4.85 × 10 ⁰⁷	0.003
944.778	434815	o	1.0	540660	e	2.0	-2.39	3.14 × 10 ⁰⁷	0.010
955.858	418375	o	1.0	522993	e	1.0	-2.23	4.37 × 10 ⁰⁷	0.027
960.052	434766	o	2.0	538927	e	2.0	-1.91	8.68 × 10 ⁰⁷	0.019
960.504	434815	o	1.0	538927	e	2.0	-2.39	2.87 × 10 ⁰⁷	0.003
965.894	380360	o	3.0	483891	e	2.0	-2.77	1.23 × 10 ⁰⁷	0.006
967.118	408775	o	2.0	512175	e	2.0	-2.82	1.11 × 10 ⁰⁷	0.005

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
976.353	434766	o	2.0	537188	e	1.0	-3.03	6.50 × 10 ⁰⁶	0.024
976.820	434815	o	1.0	537188	e	1.0	-3.39	2.86 × 10 ⁰⁶	0.013
988.865	439534	o	3.0	540660	e	2.0	-1.20	4.41 × 10 ⁰⁸	0.086
999.580	397987	o	1.0	498029	e	2.0	-4.46	2.37 × 10 ⁰⁵	0.001
1002.818	434766	o	2.0	534485	e	3.0	-1.76	1.16 × 10 ⁰⁸	0.006
1006.107	439534	o	3.0	538927	e	2.0	-1.63	1.49 × 10 ⁰⁸	0.207
1007.567	443204	o	2.0	542453	e	1.0	-1.21	3.94 × 10 ⁰⁸	0.087
1009.153	408775	o	2.0	507868	e	3.0	-2.08	5.52 × 10 ⁰⁷	0.100
1012.515	458043	o	1.0	556807	e	0.0	-1.76	1.14 × 10 ⁰⁸	0.059
1022.819	408775	o	2.0	506544	e	2.0	-3.36	2.56 × 10 ⁰⁶	0.002
1026.104	443204	o	2.0	540660	e	2.0	-2.98	6.86 × 10 ⁰⁶	0.001
1026.546	418375	o	1.0	515789	e	0.0	-1.06	5.43 × 10 ⁰⁸	0.404
1040.345	408775	o	2.0	504897	e	1.0	-4.36	2.60 × 10 ⁰⁵	0.001
1042.688	434766	o	2.0	530672	e	1.0	-1.13	4.60 × 10 ⁰⁸	0.049
1043.221	434815	o	1.0	530672	e	1.0	-1.57	1.64 × 10 ⁰⁸	0.048
1044.103	434815	o	1.0	530591	e	0.0	-1.64	1.40 × 10 ⁰⁸	0.114
1044.681	443204	o	2.0	538927	e	2.0	-0.84	8.67 × 10 ⁰⁸	0.152
1044.877	408775	o	2.0	504480	e	3.0	-2.77	1.05 × 10 ⁰⁷	0.006
1049.714	434766	o	2.0	530030	e	1.0	-1.38	2.52 × 10 ⁰⁸	0.049
1050.255	434815	o	1.0	530030	e	1.0	-2.17	4.10 × 10 ⁰⁷	0.013
1053.175	439534	o	3.0	534485	e	3.0	-1.01	5.91 × 10 ⁰⁸	0.265
1063.683	397987	o	1.0	492000	e	1.0	-2.64	1.45 × 10 ⁰⁷	0.013
1064.011	443204	o	2.0	537188	e	1.0	-3.22	3.54 × 10 ⁰⁶	0.028
1066.098	418375	o	1.0	512175	e	2.0	-0.60	1.52 × 10 ⁰⁹	0.292
1075.003	408775	o	2.0	501798	e	3.0	-2.82	8.93 × 10 ⁰⁶	0.002
1076.739	434766	o	2.0	527639	e	2.0	-2.24	3.37 × 10 ⁰⁷	0.006
1077.308	434815	o	1.0	527639	e	2.0	-2.10	4.66 × 10 ⁰⁷	0.010
1095.518	443204	o	2.0	534485	e	3.0	-6.95	6.33 × 10 ⁰²	0.000
1117.281	434766	o	2.0	524269	e	2.0	-1.66	1.17 × 10 ⁰⁸	0.015
1117.893	434815	o	1.0	524269	e	2.0	-2.17	3.62 × 10 ⁰⁷	0.013
1120.398	408775	o	2.0	498029	e	2.0	-3.37	2.32 × 10 ⁰⁶	0.002
1133.440	434766	o	2.0	522993	e	1.0	-2.09	4.37 × 10 ⁰⁷	0.024
1134.070	434815	o	1.0	522993	e	1.0	-1.87	7.09 × 10 ⁰⁷	0.025
1134.185	418375	o	1.0	506544	e	2.0	-1.03	4.40 × 10 ⁰⁸	0.278
1135.009	439534	o	3.0	527639	e	2.0	-1.31	2.59 × 10 ⁰⁸	0.334
1137.010	397987	o	1.0	485937	e	0.0	-3.87	6.81 × 10 ⁰⁵	0.002
1141.787	469225	o	1.0	556807	e	0.0	-0.56	1.41 × 10 ⁰⁹	0.414
1143.275	443204	o	2.0	530672	e	1.0	-2.83	7.55 × 10 ⁰⁶	0.002
1151.729	443204	o	2.0	530030	e	1.0	-1.30	2.53 × 10 ⁰⁸	0.192
1155.775	418375	o	1.0	504897	e	1.0	-2.22	2.89 × 10 ⁰⁷	0.027
1164.090	397987	o	1.0	483891	e	2.0	-5.09	4.13 × 10 ⁰⁴	0.000
1166.426	456721	o	0.0	542453	e	1.0	-1.99	4.91 × 10 ⁰⁷	0.018
1180.150	439534	o	3.0	524269	e	2.0	-1.00	4.84 × 10 ⁰⁸	0.218
1184.343	443204	o	2.0	527639	e	2.0	-1.29	2.49 × 10 ⁰⁸	0.159
1184.694	458043	o	1.0	542453	e	1.0	-1.38	1.90 × 10 ⁰⁸	0.036
1201.562	408775	o	2.0	492000	e	1.0	-3.74	8.97 × 10 ⁰⁵	0.001
1209.599	397987	o	1.0	480659	e	1.0	-3.81	7.18 × 10 ⁰⁵	0.001
1210.405	458043	o	1.0	540660	e	2.0	-2.06	4.11 × 10 ⁰⁷	0.009
1233.578	443204	o	2.0	524269	e	2.0	0.08	5.31 × 10 ⁰⁹	0.519
1234.964	434815	o	1.0	515789	e	0.0	-0.57	1.17 × 10 ⁰⁹	0.382
1236.338	458043	o	1.0	538927	e	2.0	-1.27	2.28 × 10 ⁰⁸	0.049
1242.745	456721	o	0.0	537188	e	1.0	-5.95	4.81 × 10 ⁰³	0.000
1253.306	443204	o	2.0	522993	e	1.0	-0.83	6.46 × 10 ⁰⁸	0.404
1255.430	418375	o	1.0	498029	e	2.0	-2.45	1.55 × 10 ⁰⁷	0.005
1263.504	458043	o	1.0	537188	e	1.0	-1.88	5.52 × 10 ⁰⁷	0.313

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1291.839	434766	o	2.0	512175	e	2.0	-0.70	8.26 × 10 ⁰⁸	0.110
1292.658	434815	o	1.0	512175	e	2.0	-1.52	1.23 × 10 ⁰⁸	0.049
1310.101	466123	o	2.0	542453	e	1.0	-0.93	4.42 × 10 ⁰⁸	0.171
1331.274	408775	o	2.0	483891	e	2.0	-0.65	8.70 × 10 ⁰⁸	0.371
1341.616	466123	o	2.0	540660	e	2.0	-0.06	3.38 × 10 ⁰⁹	0.464
1352.247	456721	o	0.0	530672	e	1.0	-0.65	8.23 × 10 ⁰⁸	0.439
1358.234	418375	o	1.0	492000	e	1.0	-1.49	1.24 × 10 ⁰⁸	0.048
1364.089	456721	o	0.0	530030	e	1.0	-0.60	9.08 × 10 ⁰⁸	0.320
1365.598	469225	o	1.0	542453	e	1.0	-0.17	2.32 × 10 ⁰⁹	0.505
1367.952	434766	o	2.0	507868	e	3.0	-0.29	1.83 × 10 ⁰⁹	0.232
1373.551	466123	o	2.0	538927	e	2.0	-0.98	3.60 × 10 ⁰⁸	0.273
1376.633	439534	o	3.0	512175	e	2.0	-0.01	3.54 × 10 ⁰⁹	0.452
1376.860	458043	o	1.0	530672	e	1.0	-0.59	8.96 × 10 ⁰⁸	0.246
1378.398	458043	o	1.0	530591	e	0.0	-0.52	1.06 × 10 ⁰⁹	0.536
1389.140	458043	o	1.0	530030	e	1.0	-0.96	3.77 × 10 ⁰⁸	0.097
1391.130	408775	o	2.0	480659	e	1.0	-1.00	3.47 × 10 ⁰⁸	0.301
1393.185	434766	o	2.0	506544	e	2.0	-0.45	1.09 × 10 ⁰⁹	0.166
1394.136	434815	o	1.0	506544	e	2.0	-0.02	2.92 × 10 ⁰⁹	0.513
1399.874	469225	o	1.0	540660	e	2.0	-0.98	3.71 × 10 ⁰⁸	0.216
1407.162	466123	o	2.0	537188	e	1.0	-2.35	1.52 × 10 ⁰⁷	0.147
1425.903	434766	o	2.0	504897	e	1.0	-3.15	2.24 × 10 ⁰⁶	0.001
1426.900	434815	o	1.0	504897	e	1.0	-0.55	9.01 × 10 ⁰⁸	0.345
1434.432	434766	o	2.0	504480	e	3.0	-0.42	1.26 × 10 ⁰⁹	0.275
1434.679	469225	o	1.0	538927	e	2.0	0.08	3.71 × 10 ⁰⁹	0.528
1436.864	458043	o	1.0	527639	e	2.0	-0.14	2.40 × 10 ⁰⁹	0.518
1449.885	443204	o	2.0	512175	e	2.0	-1.05	2.94 × 10 ⁰⁸	0.097
1462.801	466123	o	2.0	534485	e	3.0	0.27	5.88 × 10 ⁰⁹	0.541
1463.400	439534	o	3.0	507868	e	3.0	-0.11	2.43 × 10 ⁰⁹	0.239
1469.098	439534	o	3.0	507603	e	4.0	0.32	6.68 × 10 ⁰⁹	0.589
1471.389	469225	o	1.0	537188	e	1.0	-2.69	6.24 × 10 ⁰⁶	0.099
1480.122	418375	o	1.0	485937	e	0.0	-0.64	6.74 × 10 ⁰⁸	0.440
1491.825	434766	o	2.0	501798	e	3.0	0.09	3.77 × 10 ⁰⁹	0.348
1492.315	439534	o	3.0	506544	e	2.0	-1.82	3.98 × 10 ⁰⁷	0.024
1508.933	456721	o	0.0	522993	e	1.0	-0.73	5.64 × 10 ⁰⁸	0.462
1509.981	458043	o	1.0	524269	e	2.0	-3.02	2.80 × 10 ⁰⁶	0.002
1526.345	418375	o	1.0	483891	e	2.0	-0.01	2.85 × 10 ⁰⁹	0.541
1539.646	458043	o	1.0	522993	e	1.0	-0.59	7.36 × 10 ⁰⁸	0.458
1539.741	439534	o	3.0	504480	e	3.0	-0.42	1.09 × 10 ⁰⁹	0.522
1546.456	443204	o	2.0	507868	e	3.0	-0.15	1.99 × 10 ⁰⁹	0.545
1549.211	466123	o	2.0	530672	e	1.0	-0.46	9.59 × 10 ⁰⁸	0.238
1564.774	466123	o	2.0	530030	e	1.0	-0.48	9.05 × 10 ⁰⁸	0.345
1578.781	443204	o	2.0	506544	e	2.0	-1.59	6.04 × 10 ⁰⁷	0.047
1580.703	434766	o	2.0	498029	e	2.0	-0.13	2.02 × 10 ⁰⁹	0.430
1581.928	434815	o	1.0	498029	e	2.0	-0.36	1.19 × 10 ⁰⁹	0.194
1605.549	418375	o	1.0	480659	e	1.0	-0.20	1.64 × 10 ⁰⁹	0.535
1606.064	439534	o	3.0	501798	e	3.0	-0.12	1.97 × 10 ⁰⁹	0.506
1620.929	443204	o	2.0	504897	e	1.0	-0.42	9.22 × 10 ⁰⁸	0.432
1625.593	466123	o	2.0	527639	e	2.0	-1.16	1.79 × 10 ⁰⁸	0.087
1627.419	469225	o	1.0	530672	e	1.0	-2.90	3.20 × 10 ⁰⁶	0.003
1629.567	469225	o	1.0	530591	e	0.0	-1.97	2.75 × 10 ⁰⁷	0.051
1631.960	443204	o	2.0	504480	e	3.0	0.09	3.14 × 10 ⁰⁹	0.440
1644.602	469225	o	1.0	530030	e	1.0	-1.01	2.40 × 10 ⁰⁸	0.130
1706.659	443204	o	2.0	501798	e	3.0	-2.38	9.65 × 10 ⁰⁶	0.003
1709.548	439534	o	3.0	498029	e	2.0	-0.83	3.51 × 10 ⁰⁸	0.461
1711.918	469225	o	1.0	527639	e	2.0	-1.53	6.93 × 10 ⁰⁷	0.051

Table A.12. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1719.809	466123	o	2.0	524269	e	2.0	-2.37	9.65×10^6	0.005
1731.722	458043	o	1.0	515789	e	0.0	-2.44	7.99×10^6	0.029
1747.213	434766	o	2.0	492000	e	1.0	-0.43	8.80×10^8	0.466
1748.710	434815	o	1.0	492000	e	1.0	-0.66	5.12×10^8	0.227
1758.396	466123	o	2.0	522993	e	1.0	-2.57	6.00×10^6	0.017
1816.728	469225	o	1.0	524269	e	2.0	-1.15	1.45×10^8	0.179
1823.985	443204	o	2.0	498029	e	2.0	-1.53	6.07×10^7	0.055
1847.336	458043	o	1.0	512175	e	2.0	-1.31	9.91×10^7	0.155
1859.842	469225	o	1.0	522993	e	1.0	-2.67	4.32×10^6	0.005
1956.105	434815	o	1.0	485937	e	0.0	-1.39	6.72×10^7	0.227
2034.969	434766	o	2.0	483891	e	2.0	-1.18	1.10×10^8	0.318
2037.001	434815	o	1.0	483891	e	2.0	-2.08	1.39×10^7	0.020
2048.691	443204	o	2.0	492000	e	1.0	-1.07	1.48×10^8	0.101
2061.154	458043	o	1.0	506544	e	2.0	-1.82	2.00×10^7	0.048
2075.061	456721	o	0.0	504897	e	1.0	-1.64	3.33×10^7	0.142
2133.616	458043	o	1.0	504897	e	1.0	-1.21	8.45×10^7	0.194
2146.906	469225	o	1.0	515789	e	0.0	-3.17	9.60×10^5	0.003
2170.777	466123	o	2.0	512175	e	2.0	-1.75	2.64×10^7	0.019
2178.299	434766	o	2.0	480659	e	1.0	-4.37	6.01×10^4	0.000
2180.628	434815	o	1.0	480659	e	1.0	-1.65	3.14×10^7	0.041
2253.737	439534	o	3.0	483891	e	2.0	-1.24	7.74×10^7	0.327
2327.574	469225	o	1.0	512175	e	2.0	-2.06	1.14×10^7	0.038
2394.767	466123	o	2.0	507868	e	3.0	-1.61	2.84×10^7	0.053
2457.044	443204	o	2.0	483891	e	2.0	-5.68	2.38×10^3	0.000
2473.214	466123	o	2.0	506544	e	2.0	-2.41	3.44×10^6	0.008
2500.122	458043	o	1.0	498029	e	2.0	-1.84	1.62×10^7	0.036
2578.276	466123	o	2.0	504897	e	1.0	-3.12	7.17×10^5	0.003
2606.307	466123	o	2.0	504480	e	3.0	-1.81	1.57×10^7	0.021
2669.077	443204	o	2.0	480659	e	1.0	-1.62	2.26×10^7	0.141
2678.804	469225	o	1.0	506544	e	2.0	-3.01	7.15×10^5	0.002
2802.258	466123	o	2.0	501798	e	3.0	-2.32	4.14×10^6	0.005
2802.493	469225	o	1.0	504897	e	1.0	-1.62	1.91×10^7	0.078
2833.714	456721	o	0.0	492000	e	1.0	-1.95	1.05×10^7	0.126
2944.040	458043	o	1.0	492000	e	1.0	-2.12	6.68×10^6	0.029
3133.299	466123	o	2.0	498029	e	2.0	-3.94	8.17×10^4	0.000
3470.746	469225	o	1.0	498029	e	2.0	-2.70	1.16×10^6	0.005
3583.977	458043	o	1.0	485937	e	0.0	-2.44	1.73×10^6	0.098
3863.340	466123	o	2.0	492000	e	1.0	-2.31	2.58×10^6	0.018
3867.675	458043	o	1.0	483891	e	2.0	-2.56	1.28×10^6	0.035
4176.281	456721	o	0.0	480659	e	1.0	-3.12	2.92×10^5	0.014
4389.546	469225	o	1.0	492000	e	1.0	-1.94	4.85×10^6	0.035
4420.407	458043	o	1.0	480659	e	1.0	-3.68	7.21×10^4	0.002
5626.533	466123	o	2.0	483891	e	2.0	-2.60	5.75×10^5	0.041
5982.067	469225	o	1.0	485937	e	0.0	-3.65	3.56×10^4	0.007
6816.610	469225	o	1.0	483891	e	2.0	-3.76	2.78×10^4	0.001
6877.574	466123	o	2.0	480659	e	1.0	-3.08	1.21×10^5	0.008
8743.444	469225	o	1.0	480659	e	1.0	-3.54	2.61×10^4	0.002

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from Reader & Acquista (1976); Rahimullah et al. (1978); Khan et al. (1983).

Appendix B: Additional tables for xenon

Table B.1. Radial parameters (in cm^{-1}) adopted for the calculations in Xe iv.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Odd parity					
5p ³	E_{av}	29571	29733		
	$F^2(5p,5p)$	53594	48082	0.897	
	α	0	-105		
	ζ_{5p}	8331	9017	1.082	
5p ² 6p	E_{av}	220434	210991		
	$F^2(5p,5p)$	55341	42311	0.764	
	α	0	-136		
	ζ_{5p}	9030	9306	1.031	
	ζ_{6p}	1957	2359	1.205	
	$F^2(5p,6p)$	16960	13633	0.804	
	$G^0(5p,6p)$	3574	2628	0.735	
	$G^2(5p,6p)$	4748	2881	0.608	
	E_{av}	219539	210573		
5p ² 4f	$F^2(5p,5p)$	53413	38692	0.724	
	α	0	570		
	ζ_{4f}	126	126	1.000	F
	ζ_{5p}	8239	8513	1.033	
	$F^2(5p,4f)$	44254	38007	0.859	
	$G^2(5p,4f)$	35873	31088	0.867	
	$G^4(5p,4f)$	25004	18475	0.739	
	E_{av}	145882	139362		
Even parity					
5s5p ⁴	$F^2(5p,5p)$	53665	48881	0.911	
	α	0	-398		
	ζ_{5p}	8332	9009	1.081	
	$G^1(5s,5p)$	70466	50020	0.710	
5p ² 5d	E_{av}	171129	166438		
	$F^2(5p,5p)$	54305	36560	0.673	
	α	0	484		
	ζ_{5p}	8633	9163	1.061	
	ζ_{5d}	488	488	1.000	F
	$F^2(5p,5d)$	40094	33282	0.830	
	$G^1(5p,5d)$	45506	35398	0.778	
	$G^3(5p,5d)$	28625	21026	0.734	
5p ² 6s	E_{av}	188047	178843		
	$F^2(5p,5p)$	54876	42392	0.772	
	α	0	-251		
	ζ_{5p}	8890	9384	1.056	
5s5p ⁴ –5p ² 5d	$G^1(5p,5d)$	6038	3450	0.571	
	$R^1(5p5p;5s5d)$	54354	42310	0.778	
	$R^1(5p5p;5s6s)$	-1248	-1123	0.900	F
	$R^2(5p5d;5p6s)$	-12911	-8781	0.680	R
5p ² 5d–5p ² 6s	$R^1(5p5d;5p6s)$	-5224	-3553	0.680	R

^a F: Fixed parameter value; R: ratios of these parameters had been fixed in the fitting process.

Table B.2. Radial parameters (in cm^{-1}) adopted for the calculations in Xe v.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
Even parity					
5p ²	E_{av}	28481	29415		
	$F^2(5p,5p)$	55631	50605	0.910	
	α	0	-111		
	ζ_{5p}	9121	9730	1.067	
5p6p	E_{av}	253537	252141		

Table B.2. continued.

Configuration	Parameter	HFR	Fitted	Ratio	Note ^a
5p4f	ζ_{5p}	9817	8816	0.898	
	ζ_{6p}	2614	2694	1.031	
	$F^2(5p,6p)$	19855	17257	0.869	
	$G^0(5p,6p)$	4298	3568	0.830	
	$G^2(5p,6p)$	5684	5510	0.969	
	E_{av}	216146	210715		
	ζ_{4f}	178	178	1.000	F
	ζ_{5p}	8855	9606	1.085	
	$F^2(5p,4f)$	48109	40305	0.838	
	$G^2(5p,4f)$	36992	31844	0.861	
	$G^4(5p,4f)$	26416	20142	0.762	
Odd parity					
5s5p ³	E_{av}	142485	142543		
	$F^2(5p,5p)$	55684	47870	0.860	
	α	0	100		
5p5d	ζ_{5p}	9110	9952	1.092	
	$G^1(5s,5p)$	72784	55634	0.764	
	E_{av}	184432	183499		
	ζ_{5p}	9384	10095	1.076	
	ζ_{5d}	608	863	1.418	
	$F^2(5p,5d)$	43728	37678	0.862	
	$G^1(5p,5d)$	50314	39579	0.787	
5p6d	$G^3(5p,5d)$	31869	25524	0.801	
	E_{av}	307421	305556		
	ζ_{5p}	9805	9331	0.952	
	ζ_{6d}	233	233	1.000	F
	$F^2(5p,6d)$	14535	11608	0.799	
	$G^1(5p,6d)$	8677	10765	1.241	
	$G^3(5p,6d)$	6311	7518	1.191	
5p6s	E_{av}	215033	214915		
	ζ_{5p}	9664	10297	1.066	
	$G^1(5p,6s)$	6714	6378	0.950	
5p7s	E_{av}	317520	308416		
	ζ_{5p}	9833	10172	1.034	
	$G^1(5p,7s)$	2108	2015	0.956	
5s5p ³ –5p5d	$R^1(5p5p;5s5d)$	58429	46328	0.793	
5s5p ³ –5p6s	$R^1(5p5p;5s6s)$	-1254	-1129	0.900	F
5p5d–5p6s	$R^2(5p5d;5p6s)$	-13325	-12401	0.931	R
	$R^1(5p5d;5p6s)$	-5408	-5033	0.931	R

^a F: Fixed parameter value; R: ratios of these parameters have been fixed in the fitting process.

Table B.3. Comparison between available experimental and calculated energy levels in Xe IV. Energies are given in cm⁻¹.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in LS coupling ^c
Odd parity				
0.0	3	-3	1.5	81 5p ³ 4S + 12 5p ³ 2P
13267.0	13248	19	1.5	72 5p ³ 2D + 13 5p ³ 2P + 11 5p ³ 4S
17510.7	17524	-13	2.5	96 5p ³ 2D
28036.4	28043	-7	0.5	96 5p ³ 2P
35649.6	35644	5	1.5	70 5p ³ 2P + 20 5p ³ 2D + 5 5p ³ 4S
180151.5	180062	90	2.5	68 5p ² (³ P)4f 4G + 7 5p ² (¹ S)4f 2F + 7 5p ² (³ P)4f 4F
182219.1	182422	-203	3.5	50 5p ² (³ P)4f 4G + 14 5p ² (³ P)4f 4D + 14 5p ² (³ P)4f 4F
186109.1	186093	16	0.5	48 5p ² (³ P)6p 4D + 19 5p ² (³ P)6p 2S + 11 5p ² (³ P)6p 2P
187532.9	187312	221	3.5	31 5p ² (³ P)4f 4G + 27 5p ² (¹ D)4f 2G + 23 5p ² (³ P)4f 2G

Table B.3. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in <i>LS</i> coupling ^c
188251.8	187942	310	4.5	83 5p ² (³ P)4f ⁴ G + 9 5p ² (³ P)4f ⁴ F
188720.6	188478	243	2.5	52 5p ² (³ P)4f ² D + 19 5p ² (³ P)4f ⁴ G + 11 5p ² (³ P)4f ⁴ D
189842.1	189879	-37	3.5	54 5p ² (³ P)4f ⁴ D + 18 5p ² (³ P)4f ² G + 15 5p ² (¹ D)4f ² G
190792.5	190927	-135	1.5	38 5p ² (³ P)6p ⁴ D + 14 5p ² (³ P)6p ⁴ P + 12 5p ² (³ P)6p ² D
191858.2	192042	-184	1.5	43 5p ² (³ P)4f ⁴ F + 16 5p ² (³ P)4f ⁴ D + 14 5p ² (³ P)4f ² D
191978.1	192079	-101	2.5	54 5p ² (³ P)4f ⁴ D + 18 5p ² (³ P)4f ² D + 14 5p ² (³ P)4f ⁴ F
193860.6	193915	-54	0.5	47 5p ² (³ P)6p ² S + 36 5p ² (³ P)6p ⁴ D + 13 5p ² (³ P)6p ⁴ P
195784.6	195729	56	1.5	43 5p ² (³ P)4f ⁴ D + 17 5p ² (³ P)4f ² D + 9 5p ² (³ P)6p ² D
196325.2	196734	-409	3.5	56 5p ² (³ P)4f ⁴ F + 31 5p ² (¹ D)4f ² F
196506.1	196718	-212	2.5	51 5p ² (³ P)4f ⁴ F + 22 5p ² (¹ D)4f ² F + 16 5p ² (³ P)4f ⁴ D
196654.7	196546	108	0.5	86 5p ² (³ P)4f ⁴ D + 6 5p ² (¹ D)4f ² P
196724.9	196748	-23	1.5	31 5p ² (³ P)6p ⁴ D + 20 5p ² (³ P)6p ² D + 17 5p ² (³ P)4f ⁴ D
198943.1	199026	-83	2.5	85 5p ² (³ P)6p ⁴ D + 6 5p ² (¹ D)6p ² F
199397.0	199389	8	1.5	33 5p ² (³ P)4f ² D + 21 5p ² (³ P)4f ⁴ F + 17 5p ² (³ P)6p ⁴ S
200486.2	200403	83	2.5	33 5p ² (³ P)6p ⁴ P + 32 5p ² (³ P)6p ² D + 18 5p ² (¹ D)6p ² D
200899.4	200873	26	0.5	72 5p ² (³ P)6p ⁴ P + 11 5p ² (³ P)6p ² S + 10 5p ² (³ P)6p ² P
201027.6	200782	245	1.5	29 5p ² (³ P)6p ⁴ S + 21 5p ² (³ P)6p ² D + 16 5p ² (³ P)4f ² D
202076.1	202067	9	4.5	45 5p ² (³ P)4f ⁴ F + 34 5p ² (³ P)4f ² G + 11 5p ² (¹ D)4f ² H
202951.1	203327	-376	3.5	58 5p ² (³ P)6p ⁴ D + 24 5p ² (¹ D)6p ² F + 7 5p ² (³ P)4f ² F
204140.0	203905	235	1.5	47 5p ² (³ P)6p ⁴ P + 20 5p ² (³ P)6p ⁴ S + 15 5p ² (¹ D)6p ² P
205205.0	205427	-222	2.5	46 5p ² (¹ D)4f ² F + 15 5p ² (³ P)4f ² F + 8 5p ² (³ P)6p ⁴ P
205216.7	204872	345	3.5	25 5p ² (³ P)4f ² F + 19 5p ² (³ P)4f ² G + 14 5p ² (³ P)6p ⁴ D
206061.2	205962	99	1.5	52 5p ² (³ P)6p ² P + 26 5p ² (¹ D)6p ² D + 10 5p ² (¹ D)6p ² P
206216.2	206083	133	4.5	40 5p ² (¹ D)4f ² G + 31 5p ² (¹ D)4f ² H + 13 5p ² (³ P)4f ⁴ F
206713.1	206868	-155	3.5	30 5p ² (¹ D)4f ² F + 21 5p ² (¹ D)4f ² G + 14 5p ² (³ P)4f ⁴ F
207056.6	207071	-14	2.5	17 5p ² (³ P)6p ⁴ P + 16 5p ² (¹ D)4f ² F + 13 5p ² (³ P)6p ² D
208621.1	208870	-249	2.5	43 5p ² (³ P)4f ² F + 15 5p ² (³ P)6p ² D + 9 5p ² (¹ S)4f ² F
209343.7	209185	158	0.5	68 5p ² (³ P)6p ² P + 13 5p ² (³ P)6p ² S + 7 5p ² (³ P)6p ⁴ D
213735.6	213529	207	1.5	76 5p ² (¹ D)4f ² D
215625.5	215579	47	2.5	39 5p ² (¹ D)6p ² F + 24 5p ² (¹ D)4f ² D + 16 5p ² (³ P)6p ² D
216141.0	216086	55	1.5	35 5p ² (¹ D)6p ² D + 24 5p ² (¹ D)6p ² P + 7 5p ² (³ P)6p ⁴ P
216910.7	216873	37	2.5	58 5p ² (¹ D)6p ² D + 30 5p ² (³ P)6p ⁴ P + 6 5p ² (¹ D)6p ² F
217239.7	217115	125	3.5	31 5p ² (¹ D)6p ² F + 30 5p ² (³ P)4f ² F + 14 5p ² (³ P)6p ⁴ D
219001.7	219675	-673	2.5	36 5p ² (¹ D)4f ² D + 17 5p ² (³ P)6p ² D + 16 5p ² (¹ D)6p ² F
219717.3	219565	152	3.5	41 5p ² (¹ D)6p ² F + 30 5p ² (³ P)4f ² F + 12 5p ² (³ P)6p ⁴ D
220081.6	220085	-4	0.5	82 5p ² (¹ D)6p ² P + 7 5p ² (³ P)6p ² S
220789.8	220565	225	0.5	82 5p ² (¹ D)4f ² P + 5 5p ² (³ P)4f ⁴ D
224498.2	224669	-171	1.5	35 5p ² (¹ D)6p ² P + 26 5p ² (³ P)6p ² P + 14 5p ² (¹ D)6p ² D
228975.4	228900	75	3.5	79 5p ² (¹ S)4f ² F + 8 5p ² (¹ D)4f ² F
232811.4	232916	-105	0.5	82 5p ² (¹ S)6p ² P + 6 5p ² (³ P)6p ² P
235560.7	235449	112	1.5	83 5p ² (¹ S)6p ² P
				Even parity
99663.8	99384	279	2.5	84 5s5p ⁴ ⁴ P + 9 5p ² (³ P)5d ⁴ P
106923.2	106996	-72	1.5	83 5s5p ⁴ ⁴ P + 10 5p ² (³ P)5d ⁴ P
109254.4	109497	-243	0.5	82 5s5p ⁴ ⁴ P + 10 5p ² (³ P)5d ⁴ P + 6 5s5p ⁴ ² S
121928.9	122134	-205	1.5	56 5s5p ⁴ ² D + 15 5p ² (¹ D)5d ² D + 8 5p ² (³ P)5d ² P
125474.7	125429	46	2.5	69 5s5p ⁴ ² D + 19 5p ² (¹ D)5d ² D + 5 5s5p ⁴ ⁴ P
133027.4	132735	292	1.5	28 5p ² (³ P)5d ² P + 24 5p ² (³ P)5d ⁴ F + 15 5s5p ⁴ ² D
134980.6	135211	-230	1.5	56 5p ² (³ P)5d ⁴ F + 22 5p ² (³ P)5d ² P + 13 5s5p ⁴ ² P
136495.9	136607	-111	2.5	63 5p ² (³ P)5d ⁴ F + 22 5p ² (³ P)5d ⁴ D
136796.3	136825	-29	0.5	42 5p ² (³ P)5d ² P + 24 5s5p ⁴ ² P + 13 5s5p ⁴ ² S
141624.8	141917	-292	3.5	78 5p ² (³ P)5d ⁴ F + 16 5p ² (³ P)5d ⁴ D
141824.4	141665	159	2.5	39 5p ² (¹ D)5d ² F + 31 5p ² (³ P)5d ² F + 18 5p ² (³ P)5d ⁴ F
145011.2	144856	155	3.5	34 5p ² (¹ D)5d ² F + 32 5p ² (³ P)5d ⁴ D + 17 5p ² (³ P)5d ² F
145105.7	145173	-67	0.5	74 5p ² (³ P)5d ⁴ D + 13 5s5p ⁴ ² S
145991.1	146341	-350	4.5	81 5p ² (³ P)5d ⁴ F + 16 5p ² (¹ D)5d ² G
146206.5	146263	-57	1.5	78 5p ² (³ P)5d ⁴ D + 8 5p ² (³ P)5d ⁴ F

Table B.3. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in <i>LS</i> coupling ^c
148685.0	148601	84	2.5	54 $5p^2(^3P)5d^4D$ + 12 $5p^2(^3P)5d^4F$ + 12 $5p^2(^3P)5d^2F$
150737.3	150659	78	0.5	41 $5s5p^4^2S$ + 22 $5p^2(^3P)5d^2P$ + 14 $5p^2(^1D)5d^2S$
155863.9	155893	-29	3.5	42 $5p^2(^3P)5d^4D$ + 20 $5p^2(^3P)5d^2F$ + 18 $5p^2(^1D)5d^2G$
157205.0	157289	-84	0.5	69 $5p^2(^3P)6s^4P$ + 18 $5p^2(^3P)6s^2P$ + 10 $5p^2(^1S)6s^2S$
159642.8	159380	263	2.5	71 $5p^2(^3P)5d^4P$ + 9 $5p^2(^3P)5d^4D$ + 6 $5s5p^4^4P$
160665.1	160696	-31	3.5	66 $5p^2(^1D)5d^2G$ + 23 $5p^2(^1D)5d^2F$ + 7 $5p^2(^3P)5d^4D$
161434.7	161471	-36	1.5	59 $5p^2(^3P)5d^4P$ + 15 $5p^2(^1D)5d^2P$ + 7 $5s5p^4^4P$
162866.5	162752	115	0.5	63 $5p^2(^3P)5d^4P$ + 13 $5p^2(^1D)5d^2P$ + 7 $5s5p^4^4P$
163463.1	163608	-145	4.5	81 $5p^2(^1D)5d^2G$ + 16 $5p^2(^3P)5d^4F$
163596.7	163137	459	1.5	32 $5s5p^4^2P$ + 30 $5p^2(^3P)5d^2D$ + 16 $5p^2(^1S)5d^2D$
165280.0	165268	12	1.5	18 $5p^2(^1D)5d^2P$ + 17 $5s5p^4^2P$ + 17 $5p^2(^3P)5d^2D$
165995.3	166060	-65	1.5	80 $5p^2(^3P)6s^4P$ + 7 $5p^2(^3P)6s^2P$
167206.4	167606	-399	0.5	65 $5p^2(^3P)6s^2P$ + 23 $5p^2(^3P)6s^4P$
169001.5	168667	335	2.5	54 $5p^2(^3P)5d^2D$ + 15 $5p^2(^3P)5d^2F$ + 11 $5p^2(^1D)5d^2F$
170490.3	170444	47	2.5	61 $5p^2(^3P)6s^4P$ + 29 $5p^2(^1D)6s^2D$
172892.2	172288	604	0.5	49 $5p^2(^1D)5d^2P$ + 24 $5s5p^4^2P$ + 11 $5p^2(^3P)5d^4P$
173221.8	172467	755	1.5	54 $5p^2(^3P)6s^2P$ + 33 $5p^2(^1D)6s^2D$
176041.9	175731	311	2.5	27 $5p^2(^1D)5d^2F$ + 20 $5p^2(^3P)5d^2F$ + 16 $5p^2(^1D)5d^2D$
176122.2	176020	102	1.5	55 $5p^2(^1D)5d^2D$ + 14 $5s5p^4^2D$ + 12 $5p^2(^1D)5d^2P$
177923.3	177771	153	3.5	57 $5p^2(^3P)5d^2F$ + 30 $5p^2(^1D)5d^2F$ + 6 $5p^2(^1D)5d^2G$
177951.1	178819	-868	0.5	26 $5p^2(^1D)5d^2P$ + 24 $5p^2(^1D)5d^2S$ + 19 $5s5p^4^2P$
179000.5	178344	657	2.5	35 $5p^2(^1D)5d^2D$ + 29 $5p^2(^1S)5d^2D$ + 10 $5p^2(^3P)5d^2D$
182571.0	184149	-1578	1.5	33 $5p^2(^1D)6s^2D$ + 21 $5p^2(^1D)5d^2P$ + 13 $5p^2(^3P)5d^2P$
186048.6	185632	417	2.5	65 $5p^2(^1D)6s^2D$ + 25 $5p^2(^3P)6s^4P$
187546.9	187664	-117	1.5	29 $5p^2(^1D)6s^2D$ + 27 $5p^2(^3P)6s^2P$ + 18 $5p^2(^1D)5d^2P$
188272.6	188073	200	0.5	36 $5p^2(^1D)5d^2S$ + 18 $5s5p^4^2S$ + 18 $5s5p^4^2P$
190030.5	190017	14	2.5	42 $5p^2(^1S)5d^2D$ + 23 $5p^2(^3P)5d^2D$ + 12 $5p^2(^3P)5d^2F$
190369.3	190894	-525	1.5	59 $5p^2(^1S)5d^2D$ + 32 $5p^2(^3P)5d^2D$
202054.6	202052	3	0.5	86 $5p^2(^1S)6s^2S$ + 6 $5p^2(^3P)6s^4P$

^(a) From Saloman (2004).^(b) This work.^(c) Only the first three components that are larger than 5% are given.Table B.4. Comparison between available experimental and calculated energy levels in Xe v. Energies are given in cm⁻¹.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in <i>LS</i> coupling ^c
Even parity				
0.0	-6	6	0	87 $5p^2^3P$ + 10 $5p^2^1S$
9291.8	9290	2	1	97 $5p^2^3P$
14126.7	14142	-15	2	66 $5p^2^3P$ + 31 $5p^2^1D$
28411.2	28402	9	2	65 $5p^2^1D$ + 31 $5p^2^3P$
44470.4	44471	-1	0	86 $5p^2^1S$ + 10 $5p^2^3P$
186746.7	186635	111	3	54 $5p4f^3G$ + 37 $5p4f^1F$
189663.8	189859	-196	3	44 $5p4f^3F$ + 21 $5p4f^3D$ + 21 $5p4f^1F$
190644.7	190745	-101	4	52 $5p4f^3G$ + 36 $5p4f^3F$ + 7 $5p4f^1G$
191603.5	191400	204	2	78 $5p4f^3F$ + 11 $5p4f^3D$ + 7 $5p4f^1D$
200010.2	199897	113	3	32 $5p4f^1F$ + 32 $5p4f^3G$ + 31 $5p4f^3F$
201545.2	201629	-84	4	56 $5p4f^3F$ + 39 $5p4f^3G$
202281.8	202341	-59	5	95 $5p4f^3G$
205758.8	205942	-183	3	71 $5p4f^3D$ + 18 $5p4f^3F$ + 7 $5p4f^1F$
207366.7	207261	106	2	76 $5p4f^3D$ + 15 $5p4f^3F$
209310.7	209194	116	1	95 $5p4f^3D$
214317.7	214380	-62	4	87 $5p4f^1G$
216745.6	216701	44	2	82 $5p4f^1D$ + 8 $5p4f^3D$
228064.9	228416	-351	1	62 $5p6p^3D$ + 31 $5p6p^1P$

Table B.4. continued.

E_{exp}^a	E_{calc}^b	ΔE	J	Leading components (in %) in <i>LS</i> coupling ^c
233999.3	233744	255	0	83 5p6p ³ P + 10 5p6p ¹ S
234455.6	234336	120	1	41 5p6p ³ P + 18 5p6p ¹ P + 17 5p6p ³ D
235178.9	235165	14	2	71 5p6p ³ D + 11 5p6p ¹ D + 11 5p6p ³ P
243216.5	243049	168	1	42 5p6p ³ P + 24 5p6p ¹ P + 12 5p6p ³ D
244821.3	244637	184	2	53 5p6p ³ P + 22 5p6p ³ D + 16 5p6p ¹ D
246208.0	245966	242	3	95 5p6p ³ D
247810.4	247929	-119	1	40 5p6p ³ S + 36 5s5p ² 5d ⁵ D + 6 5p6p ¹ P
250557.2	251379	-822	2	63 5p6p ¹ D + 18 5p6p ³ P + 6 5p4 ¹ D
259642.3	259444	198	0	85 5p6p ¹ S + 10 5p6p ³ P
Odd parity				
92182.8	92194	-11	2	93 5s5p ³ ⁵ S + 6 5s5p ³ ³ P
115286.3	115441	-155	1	74 5s5p ³ ³ D + 10 5s5p ³ ³ P + 9 5p5d ³ D
116097.0	116138	-41	2	72 5s5p ³ ³ D + 13 5s5p ³ ³ P + 8 5p5d ³ D
119919.0	119913	6	3	88 5s5p ³ ³ D + 9 5p5d ³ D
133408.1	133488	-80	0	90 5s5p ³ ³ P + 8 5p5d ³ P
134575.2	134507	68	1	75 5s5p ³ ³ P + 10 5s5p ³ ³ D + 7 5p5d ³ P
134702.7	134496	206	2	41 5s5p ³ ³ P + 20 5s5p ³ ¹ D + 12 5s5p ³ ³ D
145807.0	145525	282	2	31 5p5d ¹ D + 28 5s5p ³ ¹ D + 27 5s5p ³ ³ P
155518.1	155393	125	1	66 5s5p ³ ³ S + 24 5s5p ³ ¹ P
156506.8	156303	204	2	86 5p5d ³ F + 8 5s5p ³ ¹ D
160630.4	160677	-47	3	89 5p5d ³ F
169672.6	170261	-588	1	32 5s5p ³ ¹ P + 20 5p5d ¹ P + 14 5s5p ³ ³ S
169799.4	170055	-255	4	96 5p5d ³ F
170987.6	170919	69	2	45 5p5d ³ P + 23 5p5d ³ D + 12 5s5p ³ ¹ D
173071.7	173063	9	1	50 5p5d ³ D + 23 5s5p ³ ¹ P + 11 5s5p ³ ³ S
181004.3	181097	-93	2	39 5p5d ³ D + 30 5p5d ¹ D + 18 5s5p ³ ¹ D
182167.2	182145	22	3	75 5p5d ³ D + 7 5s5p ³ ³ D + 6 5p5d ¹ F
183025.2	182962	63	0	87 5p5d ³ P + 8 5s5p ³ ³ P
184147.6	184100	48	1	64 5p5d ³ P + 18 5p5d ³ D + 7 5s5p ³ ³ P
185795.0	185780	15	2	41 5p5d ³ P + 22 5p5d ³ D + 14 5p5d ¹ D
194033.1	194105	-72	0	96 5p6s ³ P
194138.0	194159	-21	3	86 5p5d ¹ F + 8 5p5d ³ D
194232.9	194190	43	1	54 5p6s ³ P + 25 5p6s ¹ P + 12 5p5d ¹ P
199959.0	199730	229	1	55 5p5d ¹ P + 24 5p6s ³ P + 9 5s5p ³ ¹ P
209068.9	209078	-9	2	96 5p6s ³ P
213040.2	213053	-13	1	71 5p6s ¹ P + 18 5p6s ³ P + 6 5p5d ¹ P
287391.0	287420	-29	2	35 5p6d ³ P + 29 5p6d ³ D + 18 5p6d ¹ D
287696.0	288003	-307	3	36 5p6d ³ F + 31 5s5p ² 4f ³ G + 10 5p6d ³ D
288830.0	288586	244	1	50 5p6d ³ D + 14 5p6d ³ P + 13 5p6d ¹ P
298053.0	298054	-1	1	69 5p7s ³ P + 29 5p7s ¹ P
298739.0	298717	22	4	91 5p6d ³ F
299596.0	299417	179	2	53 5p6d ¹ D + 17 5p6d ³ D + 15 5p6d ³ F
300327.0	300484	-157	3	60 5p6d ³ D + 26 5p6d ³ F
301555.0	301796	-241	1	65 5p6d ³ P + 24 5p6d ³ D
301998.0	301794	204	0	92 5p6d ³ P
306065.0	306081	-16	1	74 5p6d ¹ P + 11 5p6d ³ D + 7 5p6d ³ P
312956.0	312959	-3	2	99 5p7s ³ P
313883.0	313880	3	1	70 5p7s ¹ P + 29 5p7s ³ P

^(a) From Saloman (2004) and Raineri et al. (2009).^(b) This work.^(c) Only the first three components that are larger than 5% are given.

Table B.5. Calculated HFR oscillator strengths ($\log gf$) and transition probabilities (gA) in Xe iv. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			$\log gf$	gA / s^{-1}	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
494.916	0	o	1.5	202055	e	0.5	-4.80	4.29×10^{05}	0.000
525.295	0	o	1.5	190369	e	1.5	-2.53	7.24×10^{07}	0.003
526.231	0	o	1.5	190031	e	2.5	-1.79	3.87×10^{08}	0.003
529.696	13267	o	1.5	202055	e	0.5	-3.32	1.14×10^{07}	0.001
531.145	0	o	1.5	188273	e	0.5	-2.84	3.43×10^{07}	0.001
533.200	0	o	1.5	187547	e	1.5	-2.03	2.18×10^{08}	0.003
537.494	0	o	1.5	186049	e	2.5	-1.74	4.20×10^{08}	0.011
547.732	0	o	1.5	182571	e	1.5	-1.79	3.64×10^{08}	0.004
558.658	0	o	1.5	179001	e	2.5	-1.64	4.86×10^{08}	0.006
561.952	0	o	1.5	177951	e	0.5	-1.77	3.63×10^{08}	0.010
564.645	13267	o	1.5	190369	e	1.5	-3.34	9.53×10^{06}	0.000
565.728	13267	o	1.5	190031	e	2.5	-2.33	9.85×10^{07}	0.000
567.788	0	o	1.5	176122	e	1.5	-4.76	3.58×10^{05}	0.000
568.047	0	o	1.5	176042	e	2.5	-3.02	1.95×10^{07}	0.000
571.410	13267	o	1.5	188273	e	0.5	-1.00	2.06×10^{09}	0.022
573.790	13267	o	1.5	187547	e	1.5	-2.39	8.33×10^{07}	0.001
574.653	28036	o	0.5	202055	e	0.5	-0.56	5.51×10^{09}	0.320
577.295	0	o	1.5	173222	e	1.5	-1.62	4.71×10^{08}	0.018
578.395	0	o	1.5	172892	e	0.5	-1.34	9.12×10^{08}	0.019
578.508	17511	o	2.5	190369	e	1.5	-3.14	1.47×10^{07}	0.002
578.765	13267	o	1.5	186049	e	2.5	-0.42	7.46×10^{09}	0.216
579.644	17511	o	2.5	190031	e	2.5	-1.14	1.45×10^{09}	0.013
586.544	0	o	1.5	170490	e	2.5	-0.03	1.83×10^{10}	0.428
588.110	17511	o	2.5	187547	e	1.5	-0.97	2.08×10^{09}	0.017
590.653	13267	o	1.5	182571	e	1.5	-0.88	2.58×10^{09}	0.014
591.711	0	o	1.5	169002	e	2.5	-0.51	5.92×10^{09}	0.104
593.338	17511	o	2.5	186049	e	2.5	-0.27	1.02×10^{10}	0.158
598.063	0	o	1.5	167206	e	0.5	-0.88	2.49×10^{09}	0.088
600.943	35650	o	1.5	202055	e	0.5	-0.87	2.50×10^{09}	0.103
602.427	0	o	1.5	165995	e	1.5	-1.37	7.90×10^{08}	0.015
603.378	13267	o	1.5	179001	e	2.5	-0.98	1.90×10^{09}	0.020
605.034	0	o	1.5	165280	e	1.5	0.19	2.79×10^{10}	0.265
605.839	17511	o	2.5	182571	e	1.5	-0.54	5.31×10^{09}	0.044
607.223	13267	o	1.5	177951	e	0.5	-2.38	7.67×10^{07}	0.001
611.259	0	o	1.5	163597	e	1.5	-4.58	4.64×10^{05}	0.000
614.000	0	o	1.5	162867	e	0.5	0.29	3.45×10^{10}	0.471
614.042	13267	o	1.5	176122	e	1.5	0.50	5.56×10^{10}	0.333
614.345	13267	o	1.5	176042	e	2.5	0.56	6.32×10^{10}	0.251
616.018	28036	o	0.5	190369	e	1.5	0.49	5.42×10^{10}	0.480
619.234	17511	o	2.5	179001	e	2.5	0.10	2.15×10^{10}	0.163
619.446	0	o	1.5	161435	e	1.5	0.60	6.84×10^{10}	0.490
623.392	17511	o	2.5	177923	e	3.5	1.02	1.81×10^{11}	0.598
624.079	28036	o	0.5	188273	e	0.5	-3.68	3.58×10^{06}	0.000
625.177	13267	o	1.5	173222	e	1.5	-0.46	5.91×10^{09}	0.086
626.398	0	o	1.5	159643	e	2.5	0.80	1.07×10^{11}	0.607
626.468	13267	o	1.5	172892	e	0.5	0.27	3.12×10^{10}	0.324
626.918	28036	o	0.5	187547	e	1.5	-0.64	3.90×10^{09}	0.069
630.471	17511	o	2.5	176122	e	1.5	-0.18	1.10×10^{10}	0.254
630.791	17511	o	2.5	176042	e	2.5	0.55	5.98×10^{10}	0.486
636.038	13267	o	1.5	170490	e	2.5	-0.65	3.72×10^{09}	0.103
636.112	0	o	1.5	157205	e	0.5	-0.17	1.12×10^{10}	0.682
642.118	13267	o	1.5	169002	e	2.5	0.58	6.17×10^{10}	0.355
642.215	17511	o	2.5	173222	e	1.5	0.28	3.08×10^{10}	0.669

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
646.330	35650	o	1.5	190369	e	1.5	0.00	1.62×10^{10}	0.349
647.104	28036	o	0.5	182571	e	1.5	0.11	2.07×10^{10}	0.313
647.749	35650	o	1.5	190031	e	2.5	0.86	1.15×10^{11}	0.517
649.606	13267	o	1.5	167206	e	0.5	-0.23	9.33×10^9	0.239
653.682	17511	o	2.5	170490	e	2.5	0.12	2.06×10^{10}	0.492
654.758	13267	o	1.5	165995	e	1.5	-0.57	4.19×10^9	0.109
655.209	35650	o	1.5	188273	e	0.5	0.39	3.84×10^{10}	0.389
657.838	13267	o	1.5	165280	e	1.5	-0.64	3.52×10^9	0.024
658.340	35650	o	1.5	187547	e	1.5	0.58	5.92×10^{10}	0.438
660.106	17511	o	2.5	169002	e	2.5	-0.01	1.49×10^{10}	0.112
663.406	0	o	1.5	150737	e	0.5	-2.02	1.45×10^8	0.007
664.898	35650	o	1.5	186049	e	2.5	-0.34	6.81×10^9	0.151
665.205	13267	o	1.5	163597	e	1.5	0.09	1.86×10^{10}	0.193
667.046	28036	o	0.5	177951	e	0.5	0.37	3.52×10^{10}	0.489
668.451	13267	o	1.5	162867	e	0.5	-1.43	5.55×10^8	0.016
672.563	0	o	1.5	148685	e	2.5	-0.28	7.65×10^9	0.259
673.471	17511	o	2.5	165995	e	1.5	-0.54	4.28×10^9	0.279
674.911	13267	o	1.5	161435	e	1.5	-1.16	1.00×10^9	0.017
675.284	28036	o	0.5	176122	e	1.5	-0.57	3.91×10^9	0.091
676.731	17511	o	2.5	165280	e	1.5	-0.15	1.03×10^{10}	0.119
680.636	35650	o	1.5	182571	e	1.5	-0.38	6.15×10^9	0.040
683.173	13267	o	1.5	159643	e	2.5	-0.67	3.07×10^9	0.066
683.964	0	o	1.5	146207	e	1.5	-0.87	1.94×10^9	0.206
684.528	17511	o	2.5	163597	e	1.5	0.07	1.65×10^{10}	0.239
688.774	28036	o	0.5	173222	e	1.5	-0.49	4.48×10^9	0.157
689.153	0	o	1.5	145106	e	0.5	-2.53	4.14×10^7	0.008
690.342	28036	o	0.5	172892	e	0.5	-3.47	4.75×10^6	0.000
694.744	13267	o	1.5	157205	e	0.5	-1.03	1.30×10^9	0.103
694.811	17511	o	2.5	161435	e	1.5	-0.73	2.56×10^9	0.186
697.589	35650	o	1.5	179001	e	2.5	-0.37	5.79×10^9	0.044
698.546	17511	o	2.5	160665	e	3.5	-0.30	6.93×10^9	0.189
702.733	35650	o	1.5	177951	e	0.5	-1.69	2.80×10^8	0.003
703.571	17511	o	2.5	159643	e	2.5	-0.43	5.00×10^9	0.340
705.097	0	o	1.5	141824	e	2.5	-1.17	9.16×10^8	0.084
711.883	35650	o	1.5	176122	e	1.5	-1.75	2.35×10^8	0.003
712.290	35650	o	1.5	176042	e	2.5	-2.14	9.40×10^7	0.001
718.546	28036	o	0.5	167206	e	0.5	-1.55	3.69×10^8	0.032
722.788	17511	o	2.5	155864	e	3.5	-0.56	3.51×10^9	0.059
724.854	28036	o	0.5	165995	e	1.5	-1.37	5.42×10^8	0.052
726.891	35650	o	1.5	173222	e	1.5	-2.51	3.82×10^7	0.001
727.430	13267	o	1.5	150737	e	0.5	-3.07	1.08×10^7	0.000
728.631	28036	o	0.5	165280	e	1.5	-0.85	1.76×10^9	0.027
728.637	35650	o	1.5	172892	e	0.5	-1.02	1.18×10^9	0.022
731.014	0	o	1.5	136796	e	0.5	-1.91	1.53×10^8	0.012
732.623	0	o	1.5	136496	e	2.5	-0.72	2.36×10^9	0.296
735.852	99664	e	2.5	235561	o	1.5	-3.28	6.55×10^6	0.002
737.679	28036	o	0.5	163597	e	1.5	-0.62	2.95×10^9	0.043
738.454	13267	o	1.5	148685	e	2.5	-0.97	1.32×10^9	0.029
740.847	0	o	1.5	134981	e	1.5	-2.07	1.04×10^8	0.012
741.616	35650	o	1.5	170490	e	2.5	-1.80	1.92×10^8	0.007
741.674	28036	o	0.5	162867	e	0.5	-1.68	2.55×10^8	0.027
749.635	28036	o	0.5	161435	e	1.5	-1.80	1.88×10^8	0.012
749.896	35650	o	1.5	169002	e	2.5	-2.27	6.34×10^7	0.001
751.725	0	o	1.5	133027	e	1.5	-1.50	3.71×10^8	0.025
752.222	13267	o	1.5	146207	e	1.5	-1.17	7.92×10^8	0.094

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
758.503	13267	o	1.5	145106	e	0.5	-1.10	9.17 × 10 ⁰⁸	0.133
760.128	35650	o	1.5	167206	e	0.5	-2.42	4.42 × 10 ⁰⁷	0.002
762.344	17511	o	2.5	148685	e	2.5	-0.88	1.50 × 10 ⁰⁹	0.180
767.191	35650	o	1.5	165995	e	1.5	-2.84	1.65 × 10 ⁰⁷	0.001
771.424	35650	o	1.5	165280	e	1.5	-1.80	1.76 × 10 ⁰⁸	0.001
773.326	99664	e	2.5	228975	o	3.5	-2.87	1.51 × 10 ⁰⁷	0.004
774.182	28036	o	0.5	157205	e	0.5	-3.99	1.13 × 10 ⁰⁶	0.000
777.026	17511	o	2.5	146207	e	1.5	-1.11	8.65 × 10 ⁰⁸	0.216
777.378	106923	e	1.5	235561	o	1.5	-3.24	6.32 × 10 ⁰⁶	0.002
777.863	13267	o	1.5	141824	e	2.5	-2.36	4.78 × 10 ⁰⁷	0.001
781.573	35650	o	1.5	163597	e	1.5	-2.80	1.70 × 10 ⁰⁷	0.000
784.311	17511	o	2.5	145011	e	3.5	-1.69	2.23 × 10 ⁰⁸	0.003
786.059	35650	o	1.5	162867	e	0.5	-2.08	8.91 × 10 ⁰⁷	0.004
791.726	109254	e	0.5	235561	o	1.5	-4.03	9.94 × 10 ⁰⁵	0.001
794.356	106923	e	1.5	232811	o	0.5	-4.48	3.54 × 10 ⁰⁵	0.001
795.007	35650	o	1.5	161435	e	1.5	-1.37	4.49 × 10 ⁰⁸	0.012
796.973	0	o	1.5	125475	e	2.5	-1.74	1.90 × 10 ⁰⁸	0.010
801.061	99664	e	2.5	224498	o	1.5	-2.60	2.63 × 10 ⁰⁷	0.008
804.417	17511	o	2.5	141824	e	2.5	-2.98	1.07 × 10 ⁰⁷	0.002
805.710	17511	o	2.5	141625	e	3.5	-1.51	3.21 × 10 ⁰⁸	0.294
806.496	35650	o	1.5	159643	e	2.5	-3.12	7.72 × 10 ⁰⁶	0.000
809.343	109254	e	0.5	232811	o	0.5	-4.26	5.63 × 10 ⁰⁵	0.003
809.525	13267	o	1.5	136796	e	0.5	-1.10	8.11 × 10 ⁰⁸	0.027
811.498	13267	o	1.5	136496	e	2.5	-1.58	2.70 × 10 ⁰⁸	0.021
814.990	28036	o	0.5	150737	e	0.5	-1.22	6.00 × 10 ⁰⁸	0.024
820.150	0	o	1.5	121929	e	1.5	-3.33	4.68 × 10 ⁰⁶	0.000
821.601	13267	o	1.5	134981	e	1.5	-2.01	9.70 × 10 ⁰⁷	0.006
822.670	35650	o	1.5	157205	e	0.5	-5.27	5.33 × 10 ⁰⁴	0.000
832.962	99664	e	2.5	219717	o	3.5	-3.74	1.74 × 10 ⁰⁶	0.001
835.001	13267	o	1.5	133027	e	1.5	-1.27	5.15 × 10 ⁰⁸	0.013
837.957	99664	e	2.5	219002	o	2.5	-2.35	4.33 × 10 ⁰⁷	0.024
840.441	17511	o	2.5	136496	e	2.5	-1.75	1.70 × 10 ⁰⁸	0.048
846.238	28036	o	0.5	146207	e	1.5	-3.47	3.15 × 10 ⁰⁶	0.001
850.514	99664	e	2.5	217240	o	3.5	-2.70	1.84 × 10 ⁰⁷	0.012
850.521	106923	e	1.5	224498	o	1.5	-2.06	8.03 × 10 ⁰⁷	0.025
851.282	17511	o	2.5	134981	e	1.5	-1.24	5.31 × 10 ⁰⁸	0.031
852.901	99664	e	2.5	216911	o	2.5	-3.49	3.01 × 10 ⁰⁶	0.001
854.195	28036	o	0.5	145106	e	0.5	-1.78	1.54 × 10 ⁰⁸	0.028
858.537	99664	e	2.5	216141	o	1.5	-2.73	1.68 × 10 ⁰⁷	0.006
862.354	99664	e	2.5	215626	o	2.5	-3.77	1.53 × 10 ⁰⁶	0.001
865.676	17511	o	2.5	133027	e	1.5	-1.36	3.86 × 10 ⁰⁸	0.018
867.726	109254	e	0.5	224498	o	1.5	-2.88	1.17 × 10 ⁰⁷	0.007
868.903	35650	o	1.5	150737	e	0.5	-1.46	3.06 × 10 ⁰⁸	0.010
876.641	99664	e	2.5	213736	o	1.5	-5.51	2.67 × 10 ⁰⁴	0.000
878.221	106923	e	1.5	220790	o	0.5	-3.67	1.86 × 10 ⁰⁶	0.002
880.035	121929	e	1.5	235561	o	1.5	-2.46	2.95 × 10 ⁰⁷	0.007
883.717	106923	e	1.5	220082	o	0.5	-2.58	2.26 × 10 ⁰⁷	0.041
884.679	35650	o	1.5	148685	e	2.5	-2.95	9.46 × 10 ⁰⁶	0.001
891.204	13267	o	1.5	125475	e	2.5	-2.50	2.63 × 10 ⁰⁷	0.001
892.232	106923	e	1.5	219002	o	2.5	-2.26	4.63 × 10 ⁰⁷	0.023
896.576	109254	e	0.5	220790	o	0.5	-4.01	8.02 × 10 ⁰⁵	0.001
901.856	121929	e	1.5	232811	o	0.5	-2.38	3.44 × 10 ⁰⁷	0.007
902.306	109254	e	0.5	220082	o	0.5	-3.12	6.24 × 10 ⁰⁶	0.018
904.512	35650	o	1.5	146207	e	1.5	-2.64	1.85 × 10 ⁰⁷	0.003
908.381	125475	e	2.5	235561	o	1.5	-1.33	3.82 × 10 ⁰⁸	0.051

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
909.194	106923	e	1.5	216911	o	2.5	-2.45	2.87×10^{07}	0.022
913.608	35650	o	1.5	145106	e	0.5	-4.32	3.83×10^{05}	0.000
915.295	0	o	1.5	109254	e	0.5	-1.18	5.24×10^{08}	0.039
915.602	106923	e	1.5	216141	o	1.5	-3.54	2.29×10^{06}	0.001
917.791	99664	e	2.5	208621	o	2.5	-2.08	6.65×10^{07}	0.053
919.457	28036	o	0.5	136796	e	0.5	-2.02	7.50×10^{07}	0.004
919.944	106923	e	1.5	215626	o	2.5	-2.00	7.81×10^{07}	0.056
920.286	13267	o	1.5	121929	e	1.5	-0.79	1.27×10^{09}	0.027
926.235	17511	o	2.5	125475	e	2.5	-0.73	1.44×10^{09}	0.030
931.161	99664	e	2.5	207057	o	2.5	-1.71	1.49×10^{08}	0.053
934.149	99664	e	2.5	206713	o	3.5	-1.78	1.27×10^{08}	0.028
935.067	28036	o	0.5	134981	e	1.5	-3.40	3.02×10^{06}	0.000
935.251	0	o	1.5	106923	e	1.5	-0.90	9.55×10^{08}	0.037
935.571	109254	e	0.5	216141	o	1.5	-2.66	1.66×10^{07}	0.015
936.221	106923	e	1.5	213736	o	1.5	-3.76	1.33×10^{06}	0.001
939.873	99664	e	2.5	206061	o	1.5	-1.77	1.29×10^{08}	0.150
941.843	35650	o	1.5	141824	e	2.5	-3.51	2.32×10^{06}	0.000
947.392	99664	e	2.5	205217	o	3.5	-3.02	7.14×10^{06}	0.004
947.497	99664	e	2.5	205205	o	2.5	-3.35	3.36×10^{06}	0.002
952.463	28036	o	0.5	133027	e	1.5	-2.49	2.36×10^{07}	0.001
957.110	109254	e	0.5	213736	o	1.5	-2.17	4.85×10^{07}	0.098
957.156	99664	e	2.5	204140	o	1.5	-2.10	5.82×10^{07}	0.016
957.687	17511	o	2.5	121929	e	1.5	-2.03	6.78×10^{07}	0.005
966.177	125475	e	2.5	228975	o	3.5	-2.30	3.62×10^{07}	0.002
968.173	99664	e	2.5	202951	o	3.5	-2.71	1.40×10^{07}	0.008
974.951	121929	e	1.5	224498	o	1.5	-1.84	1.01×10^{08}	0.008
975.293	133027	e	1.5	235561	o	1.5	-2.46	2.45×10^{07}	0.005
976.367	106923	e	1.5	209344	o	0.5	-4.59	1.79×10^{05}	0.000
983.304	106923	e	1.5	208621	o	2.5	-2.37	2.93×10^{07}	0.024
986.545	99664	e	2.5	201028	o	1.5	-1.26	3.77×10^{08}	0.179
988.663	35650	o	1.5	136796	e	0.5	-2.85	9.64×10^{06}	0.001
991.608	35650	o	1.5	136496	e	2.5	-2.90	8.47×10^{06}	0.001
991.843	99664	e	2.5	200486	o	2.5	-1.65	1.53×10^{08}	0.089
994.232	134981	e	1.5	235561	o	1.5	-2.62	1.61×10^{07}	0.005
998.668	106923	e	1.5	207057	o	2.5	-3.37	2.84×10^{06}	0.001
999.108	109254	e	0.5	209344	o	0.5	-2.83	9.73×10^{06}	0.061
1002.165	133027	e	1.5	232811	o	0.5	-2.46	2.31×10^{07}	0.005
1002.675	99664	e	2.5	199397	o	1.5	-1.42	2.52×10^{08}	0.139
1003.373	0	o	1.5	99664	e	2.5	-0.78	1.09×10^{09}	0.039
1006.735	35650	o	1.5	134981	e	1.5	-3.07	5.58×10^{06}	0.000
1007.259	99664	e	2.5	198943	o	2.5	-3.12	4.98×10^{06}	0.004
1008.695	106923	e	1.5	206061	o	1.5	-3.27	3.52×10^{06}	0.004
1009.440	136496	e	2.5	235561	o	1.5	-2.54	1.90×10^{07}	0.003
1009.861	125475	e	2.5	224498	o	1.5	-1.29	3.38×10^{08}	0.030
1011.522	121929	e	1.5	220790	o	0.5	-1.74	1.17×10^{08}	0.025
1012.511	136796	e	0.5	235561	o	1.5	-2.60	1.64×10^{07}	0.007
1017.482	106923	e	1.5	205205	o	2.5	-2.67	1.38×10^{07}	0.007
1018.821	121929	e	1.5	220082	o	0.5	-1.53	1.91×10^{08}	0.047
1022.173	134981	e	1.5	232811	o	0.5	-3.21	3.95×10^{06}	0.001
1026.928	35650	o	1.5	133027	e	1.5	-2.22	3.75×10^{07}	0.001
1028.629	106923	e	1.5	204140	o	1.5	-1.30	3.17×10^{08}	0.154
1030.155	121929	e	1.5	219002	o	2.5	-2.44	2.33×10^{07}	0.002
1030.279	99664	e	2.5	196725	o	1.5	-1.61	1.57×10^{08}	0.132
1032.607	99664	e	2.5	196506	o	2.5	-1.38	2.63×10^{08}	0.228
1032.985	109254	e	0.5	206061	o	1.5	-2.42	2.36×10^{07}	0.081

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1034.539	99664	e	2.5	196325	o	3.5	-1.31	3.10 × 10 ⁰⁸	0.215
1040.358	99664	e	2.5	195785	o	1.5	-3.74	1.12 × 10 ⁰⁶	0.001
1041.503	136796	e	0.5	232811	o	0.5	-2.68	1.28 × 10 ⁰⁷	0.008
1041.803	13267	o	1.5	109254	e	0.5	-2.69	1.26 × 10 ⁰⁷	0.007
1052.833	121929	e	1.5	216911	o	2.5	-2.47	2.03 × 10 ⁰⁷	0.012
1053.901	109254	e	0.5	204140	o	1.5	-1.35	2.63 × 10 ⁰⁸	0.159
1061.091	125475	e	2.5	219717	o	3.5	-3.30	2.95 × 10 ⁰⁶	0.001
1061.435	121929	e	1.5	216141	o	1.5	-0.95	6.69 × 10 ⁰⁸	0.090
1062.650	106923	e	1.5	201028	o	1.5	-1.89	7.49 × 10 ⁰⁷	0.031
1064.099	106923	e	1.5	200899	o	0.5	-1.95	6.64 × 10 ⁰⁷	0.068
1065.048	28036	o	0.5	121929	e	1.5	-2.49	1.91 × 10 ⁰⁷	0.001
1066.823	141824	e	2.5	235561	o	1.5	-3.62	1.42 × 10 ⁰⁶	0.001
1067.275	121929	e	1.5	215626	o	2.5	-4.05	5.20 × 10 ⁰⁵	0.000
1067.735	13267	o	1.5	106923	e	1.5	-3.78	9.69 × 10 ⁰⁵	0.000
1068.799	106923	e	1.5	200486	o	2.5	-1.63	1.37 × 10 ⁰⁸	0.164
1069.210	125475	e	2.5	219002	o	2.5	-0.76	1.04 × 10 ⁰⁹	0.114
1081.321	136496	e	2.5	228975	o	3.5	-3.40	2.28 × 10 ⁰⁶	0.000
1081.387	106923	e	1.5	199397	o	1.5	-1.42	2.17 × 10 ⁰⁸	0.121
1083.256	99664	e	2.5	191978	o	2.5	-1.02	5.43 × 10 ⁰⁸	0.251
1084.665	99664	e	2.5	191858	o	1.5	-2.36	2.50 × 10 ⁰⁷	0.037
1086.721	106923	e	1.5	198943	o	2.5	-3.12	4.32 × 10 ⁰⁶	0.003
1089.245	121929	e	1.5	213736	o	1.5	-0.88	7.39 × 10 ⁰⁸	0.087
1089.643	109254	e	0.5	201028	o	1.5	-1.61	1.37 × 10 ⁰⁸	0.144
1089.740	125475	e	2.5	217240	o	3.5	-1.45	2.01 × 10 ⁰⁸	0.045
1091.167	109254	e	0.5	200899	o	0.5	-2.52	1.68 × 10 ⁰⁷	0.078
1093.245	133027	e	1.5	224498	o	1.5	-2.97	6.11 × 10 ⁰⁶	0.001
1093.661	125475	e	2.5	216911	o	2.5	-0.76	9.63 × 10 ⁰⁸	0.174
1097.349	99664	e	2.5	190793	o	1.5	-1.29	2.87 × 10 ⁰⁸	0.250
1102.946	125475	e	2.5	216141	o	1.5	-1.85	7.83 × 10 ⁰⁷	0.016
1105.522	145106	e	0.5	235561	o	1.5	-3.54	1.58 × 10 ⁰⁶	0.001
1108.914	99664	e	2.5	189842	o	3.5	-0.47	1.84 × 10 ⁰⁹	0.341
1109.252	125475	e	2.5	215626	o	2.5	-1.39	2.20 × 10 ⁰⁸	0.037
1109.353	109254	e	0.5	199397	o	1.5	-3.25	3.00 × 10 ⁰⁶	0.004
1113.275	35650	o	1.5	125475	e	2.5	-1.31	2.62 × 10 ⁰⁸	0.014
1113.565	106923	e	1.5	196725	o	1.5	-1.94	6.14 × 10 ⁰⁷	0.023
1114.436	106923	e	1.5	196655	o	0.5	-1.65	1.20 × 10 ⁰⁸	0.194
1116.284	106923	e	1.5	196506	o	2.5	-1.18	3.58 × 10 ⁰⁸	0.173
1117.099	134981	e	1.5	224498	o	1.5	-3.61	1.33 × 10 ⁰⁶	0.000
1118.412	17511	o	2.5	106923	e	1.5	-2.10	4.22 × 10 ⁰⁷	0.061
1119.142	146207	e	1.5	235561	o	1.5	-6.75	9.53 × 10 ⁰²	0.000
1122.879	99664	e	2.5	188721	o	2.5	-1.97	5.62 × 10 ⁰⁷	0.088
1125.348	106923	e	1.5	195785	o	1.5	-1.02	5.04 × 10 ⁰⁸	0.166
1133.005	125475	e	2.5	213736	o	1.5	-1.84	7.53 × 10 ⁰⁷	0.040
1136.334	136496	e	2.5	224498	o	1.5	-6.20	3.27 × 10 ⁰³	0.000
1138.056	99664	e	2.5	187533	o	3.5	-1.14	3.77 × 10 ⁰⁸	0.319
1139.440	133027	e	1.5	220790	o	0.5	-1.72	9.88 × 10 ⁰⁷	0.029
1140.177	145106	e	0.5	232811	o	0.5	-3.71	1.01 × 10 ⁰⁶	0.001
1140.226	136796	e	0.5	224498	o	1.5	-4.06	4.44 × 10 ⁰⁵	0.000
1143.243	109254	e	0.5	196725	o	1.5	-1.71	9.88 × 10 ⁰⁷	0.069
1143.971	121929	e	1.5	209344	o	0.5	-2.83	7.51 × 10 ⁰⁶	0.003
1144.161	109254	e	0.5	196655	o	0.5	-0.95	5.64 × 10 ⁰⁸	0.289
1144.812	141625	e	3.5	228975	o	3.5	-3.10	4.02 × 10 ⁰⁶	0.003
1147.434	141824	e	2.5	228975	o	3.5	-3.23	2.97 × 10 ⁰⁶	0.001
1148.710	133027	e	1.5	220082	o	0.5	-1.90	6.36 × 10 ⁰⁷	0.019
1150.253	106923	e	1.5	193861	o	0.5	-2.51	1.55 × 10 ⁰⁷	0.033

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1151.070	148685	e	2.5	235561	o	1.5	-3.60	1.28 × 10 ⁰⁶	0.000
1153.506	121929	e	1.5	208621	o	2.5	-1.71	9.72 × 10 ⁰⁷	0.017
1154.669	146207	e	1.5	232811	o	0.5	-3.87	6.73 × 10 ⁰⁵	0.001
1155.666	109254	e	0.5	195785	o	1.5	-1.21	3.06 × 10 ⁰⁸	0.181
1157.450	13267	o	1.5	99664	e	2.5	-1.51	1.51 × 10 ⁰⁸	0.036
1159.027	35650	o	1.5	121929	e	1.5	-2.24	2.90 × 10 ⁰⁷	0.001
1163.138	133027	e	1.5	219002	o	2.5	-1.30	2.54 × 10 ⁰⁸	0.021
1165.376	134981	e	1.5	220790	o	0.5	-2.21	3.02 × 10 ⁰⁷	0.023
1174.706	121929	e	1.5	207057	o	2.5	-1.60	1.21 × 10 ⁰⁸	0.017
1175.074	134981	e	1.5	220082	o	0.5	-3.65	1.07 × 10 ⁰⁶	0.001
1175.711	106923	e	1.5	191978	o	2.5	-0.89	6.24 × 10 ⁰⁸	0.163
1177.371	106923	e	1.5	191858	o	1.5	-1.46	1.66 × 10 ⁰⁸	0.104
1178.920	150737	e	0.5	235561	o	1.5	-2.33	2.24 × 10 ⁰⁷	0.014
1181.946	109254	e	0.5	193861	o	0.5	-1.98	5.02 × 10 ⁰⁷	0.232
1188.604	121929	e	1.5	206061	o	1.5	-1.10	3.74 × 10 ⁰⁸	0.084
1190.177	134981	e	1.5	219002	o	2.5	-1.37	2.03 × 10 ⁰⁸	0.031
1190.568	136796	e	0.5	220790	o	0.5	-1.28	2.47 × 10 ⁰⁸	0.075
1190.984	145011	e	3.5	228975	o	3.5	-1.85	6.59 × 10 ⁰⁷	0.012
1192.132	133027	e	1.5	216911	o	2.5	-1.87	6.41 × 10 ⁰⁷	0.040
1192.331	106923	e	1.5	190793	o	1.5	-2.06	4.05 × 10 ⁰⁷	0.028
1200.692	136796	e	0.5	220082	o	0.5	-2.24	2.65 × 10 ⁰⁷	0.013
1200.825	121929	e	1.5	205205	o	2.5	-0.81	7.25 × 10 ⁰⁸	0.095
1201.614	136496	e	2.5	219717	o	3.5	-3.08	3.80 × 10 ⁰⁶	0.001
1202.698	125475	e	2.5	208621	o	2.5	-0.96	5.10 × 10 ⁰⁸	0.164
1203.173	133027	e	1.5	216141	o	1.5	-1.36	2.01 × 10 ⁰⁸	0.031
1205.047	145991	e	4.5	228975	o	3.5	-2.32	2.18 × 10 ⁰⁷	0.019
1209.573	141824	e	2.5	224498	o	1.5	-2.98	4.78 × 10 ⁰⁶	0.001
1210.598	109254	e	0.5	191858	o	1.5	-1.77	7.69 × 10 ⁰⁷	0.088
1210.682	133027	e	1.5	215626	o	2.5	-4.69	9.37 × 10 ⁰⁴	0.000
1211.309	99664	e	2.5	182219	o	3.5	-0.91	5.70 × 10 ⁰⁸	0.361
1212.036	136496	e	2.5	219002	o	2.5	-1.93	5.38 × 10 ⁰⁷	0.015
1216.381	121929	e	1.5	204140	o	1.5	-2.82	6.75 × 10 ⁰⁶	0.005
1217.240	17511	o	2.5	99664	e	2.5	-1.67	9.55 × 10 ⁰⁷	0.084
1218.411	150737	e	0.5	232811	o	0.5	-3.21	2.76 × 10 ⁰⁶	0.003
1220.553	134981	e	1.5	216911	o	2.5	-2.41	1.72 × 10 ⁰⁷	0.027
1222.533	106923	e	1.5	188721	o	2.5	-1.12	3.36 × 10 ⁰⁸	0.264
1225.762	125475	e	2.5	207057	o	2.5	-3.13	3.30 × 10 ⁰⁶	0.001
1226.421	109254	e	0.5	190793	o	1.5	-1.78	7.41 × 10 ⁰⁷	0.082
1230.945	125475	e	2.5	206713	o	3.5	-0.54	1.28 × 10 ⁰⁹	0.203
1231.254	28036	o	0.5	109254	e	0.5	-2.22	2.69 × 10 ⁰⁷	0.100
1232.128	134981	e	1.5	216141	o	1.5	-2.55	1.23 × 10 ⁰⁷	0.005
1238.485	136496	e	2.5	217240	o	3.5	-2.90	5.47 × 10 ⁰⁶	0.001
1239.031	133027	e	1.5	213736	o	1.5	-1.86	5.97 × 10 ⁰⁷	0.010
1240.004	134981	e	1.5	215626	o	2.5	-2.89	5.54 × 10 ⁰⁶	0.002
1240.903	125475	e	2.5	206061	o	1.5	-1.47	1.46 × 10 ⁰⁸	0.079
1242.426	99664	e	2.5	180152	o	2.5	-2.42	1.66 × 10 ⁰⁷	0.149
1243.552	136496	e	2.5	216911	o	2.5	-4.18	2.82 × 10 ⁰⁵	0.000
1245.479	148685	e	2.5	228975	o	3.5	-2.62	1.03 × 10 ⁰⁷	0.002
1254.044	125475	e	2.5	205217	o	3.5	-0.93	4.92 × 10 ⁰⁸	0.136
1254.228	125475	e	2.5	205205	o	2.5	-2.02	4.07 × 10 ⁰⁷	0.013
1255.570	136496	e	2.5	216141	o	1.5	-2.26	2.29 × 10 ⁰⁷	0.005
1259.565	145106	e	0.5	224498	o	1.5	-1.87	5.76 × 10 ⁰⁷	0.043
1260.324	136796	e	0.5	216141	o	1.5	-1.23	2.48 × 10 ⁰⁸	0.093
1262.851	106923	e	1.5	186109	o	0.5	-1.75	7.44 × 10 ⁰⁷	0.222
1263.750	136496	e	2.5	215626	o	2.5	-2.64	9.56 × 10 ⁰⁶	0.003

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1264.243	121929	e	1.5	201028	o	1.5	-3.85	5.84 × 10 ⁰⁵	0.000
1266.296	121929	e	1.5	200899	o	0.5	-1.53	1.22 × 10 ⁰⁸	0.152
1267.639	28036	o	0.5	106923	e	1.5	-4.86	5.76 × 10 ⁰⁴	0.000
1269.761	134981	e	1.5	213736	o	1.5	-3.53	1.20 × 10 ⁰⁶	0.001
1271.209	125475	e	2.5	204140	o	1.5	-1.65	9.14 × 10 ⁰⁷	0.069
1272.956	121929	e	1.5	200486	o	2.5	-1.60	1.03 × 10 ⁰⁸	0.077
1276.231	157205	e	0.5	235561	o	1.5	-3.14	2.97 × 10 ⁰⁶	0.000
1277.275	146207	e	1.5	224498	o	1.5	-5.23	2.40 × 10 ⁰⁴	0.000
1280.533	141625	e	3.5	219717	o	3.5	-2.05	3.62 × 10 ⁰⁷	0.018
1283.814	141824	e	2.5	219717	o	3.5	-2.89	5.19 × 10 ⁰⁶	0.001
1290.716	125475	e	2.5	202951	o	3.5	-1.94	4.64 × 10 ⁰⁷	0.026
1290.854	121929	e	1.5	199397	o	1.5	-1.87	5.34 × 10 ⁰⁷	0.026
1292.375	141625	e	3.5	219002	o	2.5	-2.74	7.39 × 10 ⁰⁶	0.004
1294.671	136496	e	2.5	213736	o	1.5	-2.59	1.01 × 10 ⁰⁷	0.006
1295.718	141824	e	2.5	219002	o	2.5	-1.67	8.74 × 10 ⁰⁷	0.016
1298.462	121929	e	1.5	198943	o	2.5	-3.80	6.19 × 10 ⁰⁵	0.001
1299.726	136796	e	0.5	213736	o	1.5	-4.26	2.13 × 10 ⁰⁵	0.000
1301.157	109254	e	0.5	186109	o	0.5	-2.81	6.05 × 10 ⁰⁶	0.039
1310.336	133027	e	1.5	209344	o	0.5	-2.47	1.32 × 10 ⁰⁷	0.003
1317.212	159643	e	2.5	235561	o	1.5	-3.05	3.46 × 10 ⁰⁶	0.001
1319.032	148685	e	2.5	224498	o	1.5	-5.38	1.61 × 10 ⁰⁴	0.000
1321.281	145106	e	0.5	220790	o	0.5	-1.62	9.07 × 10 ⁰⁷	0.075
1322.491	141625	e	3.5	217240	o	3.5	-2.84	5.47 × 10 ⁰⁶	0.003
1322.639	157205	e	0.5	232811	o	0.5	-3.89	4.90 × 10 ⁰⁵	0.000
1322.862	133027	e	1.5	208621	o	2.5	-1.95	4.34 × 10 ⁰⁷	0.007
1323.576	125475	e	2.5	201028	o	1.5	-1.98	3.97 × 10 ⁰⁷	0.047
1325.991	141824	e	2.5	217240	o	3.5	-3.70	7.56 × 10 ⁰⁵	0.000
1328.270	141625	e	3.5	216911	o	2.5	-3.71	7.34 × 10 ⁰⁵	0.000
1331.801	141824	e	2.5	216911	o	2.5	-2.15	2.66 × 10 ⁰⁷	0.012
1333.129	125475	e	2.5	200486	o	2.5	-1.45	1.33 × 10 ⁰⁸	0.068
1333.762	145106	e	0.5	220082	o	0.5	-4.16	2.61 × 10 ⁰⁵	0.000
1336.970	121929	e	1.5	196725	o	1.5	-1.85	5.27 × 10 ⁰⁷	0.023
1338.226	121929	e	1.5	196655	o	0.5	-3.64	8.54 × 10 ⁰⁵	0.002
1338.579	145011	e	3.5	219717	o	3.5	-0.89	4.76 × 10 ⁰⁸	0.045
1340.783	146207	e	1.5	220790	o	0.5	-3.05	3.30 × 10 ⁰⁶	0.006
1340.892	121929	e	1.5	196506	o	2.5	-1.40	1.48 × 10 ⁰⁸	0.056
1344.753	134981	e	1.5	209344	o	0.5	-2.68	7.69 × 10 ⁰⁶	0.003
1345.594	141824	e	2.5	216141	o	1.5	-3.49	1.21 × 10 ⁰⁶	0.000
1349.054	161435	e	1.5	235561	o	1.5	-2.98	3.82 × 10 ⁰⁶	0.002
1350.818	133027	e	1.5	207057	o	2.5	-0.97	3.92 × 10 ⁰⁸	0.053
1351.339	141625	e	3.5	215626	o	2.5	-2.39	1.47 × 10 ⁰⁷	0.005
1351.525	145011	e	3.5	219002	o	2.5	-1.31	1.84 × 10 ⁰⁸	0.019
1352.772	125475	e	2.5	199397	o	1.5	-2.20	2.32 × 10 ⁰⁷	0.040
1353.636	146207	e	1.5	220082	o	0.5	-2.06	3.17 × 10 ⁰⁷	0.058
1353.992	121929	e	1.5	195785	o	1.5	-2.23	2.12 × 10 ⁰⁷	0.009
1354.993	141824	e	2.5	215626	o	2.5	-1.63	8.52 × 10 ⁰⁷	0.017
1355.732	150737	e	0.5	224498	o	1.5	-0.99	3.76 × 10 ⁰⁸	0.099
1356.370	145991	e	4.5	219717	o	3.5	-1.75	6.44 × 10 ⁰⁷	0.008
1357.948	134981	e	1.5	208621	o	2.5	-2.94	4.18 × 10 ⁰⁶	0.001
1358.607	35650	o	1.5	109254	e	0.5	-2.86	5.06 × 10 ⁰⁶	0.005
1361.129	125475	e	2.5	198943	o	2.5	-1.53	1.06 × 10 ⁰⁸	0.183
1365.592	106923	e	1.5	180152	o	2.5	-1.60	9.02 × 10 ⁰⁷	0.310
1367.774	155864	e	3.5	228975	o	3.5	-2.07	3.06 × 10 ⁰⁷	0.010
1369.229	133027	e	1.5	206061	o	1.5	-1.57	9.62 × 10 ⁰⁷	0.022
1373.717	146207	e	1.5	219002	o	2.5	-2.13	2.65 × 10 ⁰⁷	0.016

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1375.626	162867	e	0.5	235561	o	1.5	-3.72	6.68×10^{05}	0.001
1378.409	136796	e	0.5	209344	o	0.5	-1.36	1.54×10^{08}	0.055
1384.495	145011	e	3.5	217240	o	3.5	-2.32	1.66×10^{07}	0.002
1385.471	133027	e	1.5	205205	o	2.5	-1.36	1.56×10^{08}	0.025
1386.478	136496	e	2.5	208621	o	2.5	-2.94	3.99×10^{06}	0.001
1387.424	134981	e	1.5	207057	o	2.5	-1.32	1.64×10^{08}	0.050
1389.584	163597	e	1.5	235561	o	1.5	-1.67	7.38×10^{07}	0.030
1390.208	121929	e	1.5	193861	o	0.5	-2.06	3.00×10^{07}	0.035
1390.604	141824	e	2.5	213736	o	1.5	-1.41	1.34×10^{08}	0.037
1390.830	145011	e	3.5	216911	o	2.5	-2.07	2.94×10^{07}	0.003
1401.017	161435	e	1.5	232811	o	0.5	-1.87	4.59×10^{07}	0.037
1403.044	35650	o	1.5	106923	e	1.5	-2.11	2.66×10^{07}	0.013
1403.505	125475	e	2.5	196725	o	1.5	-4.81	5.21×10^{04}	0.000
1403.536	145991	e	4.5	217240	o	3.5	-1.77	5.64×10^{07}	0.008
1406.221	133027	e	1.5	204140	o	1.5	-1.87	4.56×10^{07}	0.023
1406.854	134981	e	1.5	206061	o	1.5	-1.34	1.52×10^{08}	0.073
1407.751	145106	e	0.5	216141	o	1.5	-1.47	1.15×10^{08}	0.109
1407.810	148685	e	2.5	219717	o	3.5	-2.25	1.90×10^{07}	0.005
1407.828	125475	e	2.5	196506	o	2.5	-1.50	1.08×10^{08}	0.101
1411.423	125475	e	2.5	196325	o	3.5	-0.68	7.03×10^{08}	0.238
1414.343	146207	e	1.5	216911	o	2.5	-1.91	4.14×10^{07}	0.071
1416.144	145011	e	3.5	215626	o	2.5	-3.09	2.72×10^{06}	0.000
1417.220	136496	e	2.5	207057	o	2.5	-2.83	4.88×10^{06}	0.001
1422.137	148685	e	2.5	219002	o	2.5	-1.43	1.26×10^{08}	0.037
1422.275	125475	e	2.5	195785	o	1.5	-2.29	1.70×10^{07}	0.023
1422.866	165280	e	1.5	235561	o	1.5	-4.08	2.72×10^{05}	0.000
1424.006	134981	e	1.5	205205	o	2.5	-2.77	5.64×10^{06}	0.003
1424.152	136496	e	2.5	206713	o	3.5	-4.62	7.96×10^{04}	0.000
1427.501	150737	e	0.5	220790	o	0.5	-1.26	1.78×10^{08}	0.084
1427.568	121929	e	1.5	191978	o	2.5	-0.99	3.31×10^{08}	0.184
1429.697	162867	e	0.5	232811	o	0.5	-2.22	1.98×10^{07}	0.044
1429.909	146207	e	1.5	216141	o	1.5	-1.36	1.44×10^{08}	0.096
1430.016	121929	e	1.5	191858	o	1.5	-4.35	1.45×10^{05}	0.000
1437.496	165995	e	1.5	235561	o	1.5	-2.72	6.13×10^{06}	0.003
1437.498	136496	e	2.5	206061	o	1.5	-4.40	1.28×10^{05}	0.000
1440.528	146207	e	1.5	215626	o	2.5	-2.37	1.38×10^{07}	0.012
1442.080	150737	e	0.5	220082	o	0.5	-1.10	2.53×10^{08}	0.207
1442.323	159643	e	2.5	228975	o	3.5	-3.72	6.13×10^{05}	0.000
1443.733	136796	e	0.5	206061	o	1.5	-5.39	1.30×10^{04}	0.000
1444.780	163597	e	1.5	232811	o	0.5	-1.40	1.30×10^{08}	0.043
1445.935	134981	e	1.5	204140	o	1.5	-3.14	2.30×10^{06}	0.003
1452.146	121929	e	1.5	190793	o	1.5	-2.11	2.43×10^{07}	0.028
1455.164	136496	e	2.5	205217	o	3.5	-4.52	9.43×10^{04}	0.000
1455.411	136496	e	2.5	205205	o	2.5	-1.54	9.07×10^{07}	0.025
1457.091	145106	e	0.5	213736	o	1.5	-2.70	6.16×10^{06}	0.005
1458.689	148685	e	2.5	217240	o	3.5	-2.03	2.91×10^{07}	0.007
1462.966	167206	e	0.5	235561	o	1.5	-2.64	7.00×10^{06}	0.003
1463.908	160665	e	3.5	228975	o	3.5	-1.83	4.57×10^{07}	0.027
1465.723	148685	e	2.5	216911	o	2.5	-1.27	1.65×10^{08}	0.055
1470.584	133027	e	1.5	201028	o	1.5	-1.75	5.52×10^{07}	0.017
1473.362	133027	e	1.5	200899	o	0.5	-3.57	8.26×10^{05}	0.001
1478.326	136496	e	2.5	204140	o	1.5	-1.69	6.15×10^{07}	0.025
1480.793	165280	e	1.5	232811	o	0.5	-1.37	1.29×10^{08}	0.053
1480.843	146207	e	1.5	213736	o	1.5	-2.66	6.57×10^{06}	0.005
1482.386	133027	e	1.5	200486	o	2.5	-3.03	2.88×10^{06}	0.002

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1482.448	148685	e	2.5	216141	o	1.5	-1.34	1.38 × 10 ⁰⁸	0.033
1484.920	136796	e	0.5	204140	o	1.5	-1.26	1.64 × 10 ⁰⁸	0.135
1486.034	157205	e	0.5	224498	o	1.5	-6.31	1.49 × 10 ⁰³	0.000
1492.620	141625	e	3.5	208621	o	2.5	-2.55	8.45 × 10 ⁰⁶	0.008
1493.864	148685	e	2.5	215626	o	2.5	-1.67	6.36 × 10 ⁰⁷	0.020
1496.645	165995	e	1.5	232811	o	0.5	-2.61	7.27 × 10 ⁰⁶	0.006
1497.080	141824	e	2.5	208621	o	2.5	-0.91	3.68 × 10 ⁰⁸	0.081
1497.192	121929	e	1.5	188721	o	2.5	-1.13	2.18 × 10 ⁰⁸	0.078
1502.422	169002	e	2.5	235561	o	1.5	-1.79	4.88 × 10 ⁰⁷	0.025
1503.683	125475	e	2.5	191978	o	2.5	-2.72	5.66 × 10 ⁰⁶	0.006
1504.773	136496	e	2.5	202951	o	3.5	-4.13	2.18 × 10 ⁰⁵	0.000
1506.398	125475	e	2.5	191858	o	1.5	-2.18	1.97 × 10 ⁰⁷	0.061
1506.714	133027	e	1.5	199397	o	1.5	-2.03	2.77 × 10 ⁰⁷	0.008
1514.073	134981	e	1.5	201028	o	1.5	-3.87	3.83 × 10 ⁰⁵	0.000
1517.018	134981	e	1.5	200899	o	0.5	-1.24	1.65 × 10 ⁰⁸	0.261
1517.089	133027	e	1.5	198943	o	2.5	-5.64	6.68 × 10 ⁰³	0.000
1524.274	167206	e	0.5	232811	o	0.5	-2.22	1.73 × 10 ⁰⁷	0.014
1526.431	163463	e	4.5	228975	o	3.5	-1.37	1.23 × 10 ⁰⁸	0.083
1526.587	134981	e	1.5	200486	o	2.5	-2.31	1.38 × 10 ⁰⁷	0.030
1528.309	141625	e	3.5	207057	o	2.5	-2.52	8.65 × 10 ⁰⁶	0.003
1528.965	150737	e	0.5	216141	o	1.5	-2.20	1.79 × 10 ⁰⁷	0.011
1530.976	125475	e	2.5	190793	o	1.5	-1.99	2.94 × 10 ⁰⁷	0.059
1532.985	141824	e	2.5	207057	o	2.5	-2.91	3.50 × 10 ⁰⁶	0.001
1536.374	141625	e	3.5	206713	o	3.5	-1.96	3.11 × 10 ⁰⁷	0.011
1536.797	170490	e	2.5	235561	o	1.5	-2.98	2.97 × 10 ⁰⁶	0.001
1537.265	148685	e	2.5	213736	o	1.5	-1.23	1.65 × 10 ⁰⁸	0.087
1541.100	141824	e	2.5	206713	o	3.5	-2.12	2.17 × 10 ⁰⁷	0.002
1541.892	159643	e	2.5	224498	o	1.5	-2.67	6.08 × 10 ⁰⁶	0.003
1548.194	141625	e	3.5	206216	o	4.5	-3.53	8.19 × 10 ⁰⁵	0.000
1549.626	136496	e	2.5	201028	o	1.5	-2.14	2.01 × 10 ⁰⁷	0.011
1552.400	134981	e	1.5	199397	o	1.5	-2.35	1.22 × 10 ⁰⁷	0.007
1553.581	125475	e	2.5	189842	o	3.5	-2.06	2.39 × 10 ⁰⁷	0.042
1556.711	145106	e	0.5	209344	o	0.5	-1.74	4.97 × 10 ⁰⁷	0.105
1556.740	141824	e	2.5	206061	o	1.5	-1.14	2.01 × 10 ⁰⁸	0.106
1556.873	136796	e	0.5	201028	o	1.5	-1.10	2.19 × 10 ⁰⁸	0.089
1558.113	121929	e	1.5	186109	o	0.5	-1.01	2.66 × 10 ⁰⁸	0.286
1559.987	136796	e	0.5	200899	o	0.5	-2.21	1.70 × 10 ⁰⁷	0.014
1562.153	35650	o	1.5	99664	e	2.5	-2.69	5.54 × 10 ⁰⁶	0.004
1562.737	136496	e	2.5	200486	o	2.5	-1.27	1.44 × 10 ⁰⁸	0.127
1563.416	134981	e	1.5	198943	o	2.5	-1.93	3.17 × 10 ⁰⁷	0.103
1566.087	155864	e	3.5	219717	o	3.5	-0.46	9.29 × 10 ⁰⁸	0.181
1569.920	133027	e	1.5	196725	o	1.5	-1.40	1.10 × 10 ⁰⁸	0.032
1571.652	133027	e	1.5	196655	o	0.5	-1.93	3.22 × 10 ⁰⁷	0.038
1572.082	145011	e	3.5	208621	o	2.5	-3.30	1.36 × 10 ⁰⁶	0.000
1572.527	141625	e	3.5	205217	o	3.5	-1.81	4.14 × 10 ⁰⁷	0.021
1572.703	157205	e	0.5	220790	o	0.5	-2.87	3.60 × 10 ⁰⁶	0.016
1572.817	141625	e	3.5	205205	o	2.5	-2.51	8.31 × 10 ⁰⁶	0.006
1575.332	133027	e	1.5	196506	o	2.5	-1.02	2.60 × 10 ⁰⁸	0.073
1577.479	141824	e	2.5	205217	o	3.5	-2.15	1.89 × 10 ⁰⁷	0.003
1577.770	141824	e	2.5	205205	o	2.5	-1.04	2.46 × 10 ⁰⁸	0.042
1581.130	125475	e	2.5	188721	o	2.5	-1.84	3.86 × 10 ⁰⁷	0.037
1583.837	155864	e	3.5	219002	o	2.5	-1.91	3.35 × 10 ⁰⁷	0.006
1583.852	146207	e	1.5	209344	o	0.5	-1.96	2.90 × 10 ⁰⁷	0.038
1585.703	161435	e	1.5	224498	o	1.5	-2.25	1.51 × 10 ⁰⁷	0.004
1587.344	150737	e	0.5	213736	o	1.5	-2.25	1.48 × 10 ⁰⁷	0.014

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
1589.797	136496	e	2.5	199397	o	1.5	-2.81	4.09×10^6	0.002
1590.417	157205	e	0.5	220082	o	0.5	-4.46	9.06×10^4	0.000
1593.443	133027	e	1.5	195785	o	1.5	-2.34	1.20×10^7	0.004
1595.698	172892	e	0.5	235561	o	1.5	-3.00	2.69×10^6	0.003
1597.426	136796	e	0.5	199397	o	1.5	-1.70	5.21×10^7	0.018
1601.353	136496	e	2.5	198943	o	2.5	-1.35	1.16×10^8	0.030
1602.189	146207	e	1.5	208621	o	2.5	-2.14	1.88×10^7	0.020
1604.135	173222	e	1.5	235561	o	1.5	-1.76	4.57×10^7	0.043
1604.735	141824	e	2.5	204140	o	1.5	-3.39	1.05×10^6	0.001
1611.391	125475	e	2.5	187533	o	3.5	-3.72	4.93×10^5	0.001
1611.723	145011	e	3.5	207057	o	2.5	-1.24	1.50×10^8	0.020
1619.583	134981	e	1.5	196725	o	1.5	-0.95	2.86×10^8	0.148
1620.696	145011	e	3.5	206713	o	3.5	-2.56	7.14×10^6	0.001
1621.426	134981	e	1.5	196655	o	0.5	-1.94	2.88×10^7	0.045
1622.542	162867	e	0.5	224498	o	1.5	-3.22	1.53×10^6	0.001
1625.342	134981	e	1.5	196506	o	2.5	-2.46	8.82×10^6	0.008
1629.307	155864	e	3.5	217240	o	3.5	-1.19	1.62×10^8	0.033
1630.622	141625	e	3.5	202951	o	3.5	-1.79	4.09×10^7	0.015
1633.853	145011	e	3.5	206216	o	4.5	-1.23	1.46×10^8	0.011
1635.946	141824	e	2.5	202951	o	3.5	-1.85	3.56×10^7	0.017
1638.088	155864	e	3.5	216911	o	2.5	-0.38	1.04×10^9	0.210
1640.541	145106	e	0.5	206061	o	1.5	-2.82	3.74×10^6	0.012
1641.996	163597	e	1.5	224498	o	1.5	-2.13	1.88×10^7	0.004
1643.383	146207	e	1.5	207057	o	2.5	-1.76	4.31×10^7	0.017
1643.839	133027	e	1.5	193861	o	0.5	-2.11	1.93×10^7	0.008
1644.629	134981	e	1.5	195785	o	1.5	-3.54	6.99×10^5	0.000
1646.850	145991	e	4.5	206713	o	3.5	-2.93	2.85×10^6	0.003
1654.224	141625	e	3.5	202076	o	4.5	-1.32	1.16×10^8	0.021
1660.330	136496	e	2.5	196725	o	1.5	-1.01	2.37×10^8	0.046
1660.437	145991	e	4.5	206216	o	4.5	-1.68	5.02×10^7	0.024
1660.978	145011	e	3.5	205217	o	3.5	-0.82	3.65×10^8	0.067
1661.301	145011	e	3.5	205205	o	2.5	-1.50	7.75×10^7	0.019
1664.600	159643	e	2.5	219717	o	3.5	-2.40	9.70×10^6	0.006
1666.383	136496	e	2.5	196506	o	2.5	-1.92	2.87×10^7	0.007
1667.392	169002	e	2.5	228975	o	3.5	-3.01	2.36×10^6	0.001
1668.444	148685	e	2.5	208621	o	2.5	-1.16	1.68×10^8	0.062
1668.652	136796	e	0.5	196725	o	1.5	-2.33	1.12×10^7	0.009
1668.914	172892	e	0.5	232811	o	0.5	-1.85	3.48×10^7	0.072
1670.609	136796	e	0.5	196655	o	0.5	-2.00	2.41×10^7	0.067
1670.713	146207	e	1.5	206061	o	1.5	-1.45	8.39×10^7	0.172
1671.422	136496	e	2.5	196325	o	3.5	-0.91	2.94×10^8	0.060
1673.315	155864	e	3.5	215626	o	2.5	-1.00	2.38×10^8	0.042
1678.145	173222	e	1.5	232811	o	0.5	-2.06	2.10×10^7	0.015
1680.141	176042	e	2.5	235561	o	1.5	-1.14	1.72×10^8	0.060
1682.411	176122	e	1.5	235561	o	1.5	-1.60	5.88×10^7	0.071
1684.667	159643	e	2.5	219002	o	2.5	-2.62	5.81×10^6	0.004
1684.775	161435	e	1.5	220790	o	0.5	-2.64	5.38×10^6	0.007
1686.662	136496	e	2.5	195785	o	1.5	-2.79	3.79×10^6	0.001
1688.459	145991	e	4.5	205217	o	3.5	-0.45	8.03×10^8	0.264
1688.670	165280	e	1.5	224498	o	1.5	-2.19	1.53×10^7	0.002
1689.098	141824	e	2.5	201028	o	1.5	-0.73	4.37×10^8	0.136
1693.417	160665	e	3.5	219717	o	3.5	-0.93	2.70×10^8	0.070
1693.930	145106	e	0.5	204140	o	1.5	-2.67	4.95×10^6	0.007
1694.958	146207	e	1.5	205205	o	2.5	-1.14	1.68×10^8	0.091
1695.251	136796	e	0.5	195785	o	1.5	-1.20	1.47×10^8	0.069

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1696.333	133027	e	1.5	191978	o	2.5	-2.05	2.11 × 10 ⁰⁷	0.007
1696.756	157205	e	0.5	216141	o	1.5	-2.67	4.94 × 10 ⁰⁶	0.001
1698.370	134981	e	1.5	193861	o	0.5	-0.42	8.73 × 10 ⁰⁸	0.393
1698.906	141625	e	3.5	200486	o	2.5	-1.00	2.26 × 10 ⁰⁸	0.239
1699.790	133027	e	1.5	191858	o	1.5	-1.48	7.75 × 10 ⁰⁷	0.029
1704.687	141824	e	2.5	200486	o	2.5	-1.06	2.02 × 10 ⁰⁸	0.128
1705.120	161435	e	1.5	220082	o	0.5	-4.50	7.29 × 10 ⁰⁴	0.000
1706.298	150737	e	0.5	209344	o	0.5	-1.29	1.18 × 10 ⁰⁸	0.103
1709.317	165995	e	1.5	224498	o	1.5	-1.88	3.00 × 10 ⁰⁷	0.008
1709.837	170490	e	2.5	228975	o	3.5	-1.68	4.79 × 10 ⁰⁷	0.080
1713.162	148685	e	2.5	207057	o	2.5	-0.60	5.76 × 10 ⁰⁸	0.118
1714.190	160665	e	3.5	219002	o	2.5	-0.52	7.04 × 10 ⁰⁸	0.158
1717.546	121929	e	1.5	180152	o	2.5	-0.86	3.09 × 10 ⁰⁸	0.243
1723.303	148685	e	2.5	206713	o	3.5	-1.12	1.71 × 10 ⁰⁸	0.024
1725.926	145011	e	3.5	202951	o	3.5	-0.45	8.13 × 10 ⁰⁸	0.176
1726.117	146207	e	1.5	204140	o	1.5	-0.81	3.44 × 10 ⁰⁸	0.212
1726.421	162867	e	0.5	220790	o	0.5	-1.57	6.04 × 10 ⁰⁷	0.044
1731.149	133027	e	1.5	190793	o	1.5	-1.30	1.12 × 10 ⁰⁸	0.054
1735.822	177951	e	0.5	235561	o	1.5	-3.03	2.02 × 10 ⁰⁶	0.003
1736.205	159643	e	2.5	217240	o	3.5	-2.01	2.17 × 10 ⁰⁷	0.015
1736.937	141824	e	2.5	199397	o	1.5	-2.87	3.01 × 10 ⁰⁶	0.001
1737.106	161435	e	1.5	219002	o	2.5	-3.16	1.56 × 10 ⁰⁶	0.001
1742.883	148685	e	2.5	206061	o	1.5	-2.62	5.32 × 10 ⁰⁶	0.005
1744.644	141625	e	3.5	198943	o	2.5	0.20	3.47 × 10 ⁰⁹	0.509
1745.450	167206	e	0.5	224498	o	1.5	-5.63	5.13 × 10 ⁰³	0.000
1746.179	159643	e	2.5	216911	o	2.5	-1.38	9.22 × 10 ⁰⁷	0.038
1747.790	162867	e	0.5	220082	o	0.5	-2.11	1.69 × 10 ⁰⁷	0.022
1748.463	163597	e	1.5	220790	o	0.5	-2.17	1.48 × 10 ⁰⁷	0.015
1750.740	141824	e	2.5	198943	o	2.5	-0.64	5.06 × 10 ⁰⁸	0.300
1752.391	145011	e	3.5	202076	o	4.5	-3.59	5.66 × 10 ⁰⁵	0.000
1752.409	136796	e	0.5	193861	o	0.5	-0.91	2.67 × 10 ⁰⁸	0.308
1754.463	134981	e	1.5	191978	o	2.5	-1.04	1.95 × 10 ⁰⁸	0.127
1755.618	145991	e	4.5	202951	o	3.5	0.27	3.99 × 10 ⁰⁹	0.497
1758.161	134981	e	1.5	191858	o	1.5	-2.28	1.14 × 10 ⁰⁷	0.007
1762.288	125475	e	2.5	182219	o	3.5	-1.46	7.58 × 10 ⁰⁷	0.108
1764.004	176122	e	1.5	232811	o	0.5	-2.59	5.60 × 10 ⁰⁶	0.010
1767.578	160665	e	3.5	217240	o	3.5	-2.25	1.21 × 10 ⁰⁷	0.003
1768.028	179001	e	2.5	235561	o	1.5	-0.38	8.99 × 10 ⁰⁸	0.213
1768.919	148685	e	2.5	205217	o	3.5	-2.23	1.24 × 10 ⁰⁷	0.003
1768.953	157205	e	0.5	213736	o	1.5	-2.12	1.61 × 10 ⁰⁷	0.037
1769.285	148685	e	2.5	205205	o	2.5	-1.41	8.35 × 10 ⁰⁷	0.022
1769.968	159643	e	2.5	216141	o	1.5	-2.23	1.28 × 10 ⁰⁷	0.006
1770.385	163597	e	1.5	220082	o	0.5	-1.23	1.27 × 10 ⁰⁸	0.139
1777.645	163463	e	4.5	219717	o	3.5	0.01	2.14 × 10 ⁰⁹	0.305
1777.917	160665	e	3.5	216911	o	2.5	-0.16	1.47 × 10 ⁰⁹	0.490
1783.008	145991	e	4.5	202076	o	4.5	-0.93	2.45 × 10 ⁰⁸	0.116
1786.266	159643	e	2.5	215626	o	2.5	-3.65	4.68 × 10 ⁰⁵	0.000
1788.208	145106	e	0.5	201028	o	1.5	-1.51	6.40 × 10 ⁰⁷	0.080
1791.733	134981	e	1.5	190793	o	1.5	-0.95	2.31 × 10 ⁰⁸	0.181
1792.317	145106	e	0.5	200899	o	0.5	-0.73	3.84 × 10 ⁰⁸	0.427
1795.551	133027	e	1.5	188721	o	2.5	-0.88	2.75 × 10 ⁰⁸	0.053
1801.484	165280	e	1.5	220790	o	0.5	-3.73	3.80 × 10 ⁰⁵	0.000
1801.909	169002	e	2.5	224498	o	1.5	-2.24	1.21 × 10 ⁰⁷	0.002
1802.380	136496	e	2.5	191978	o	2.5	-1.93	2.40 × 10 ⁰⁷	0.010
1802.581	161435	e	1.5	216911	o	2.5	-2.05	1.83 × 10 ⁰⁷	0.012

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1802.614	145011	e	3.5	200486	o	2.5	0.05	2.31×10^{09}	0.435
1803.264	148685	e	2.5	204140	o	1.5	-0.63	4.81×10^{08}	0.156
1804.891	163597	e	1.5	219002	o	2.5	-0.89	2.75×10^{08}	0.056
1806.283	136496	e	2.5	191858	o	1.5	-0.52	6.20×10^{08}	0.222
1807.537	150737	e	0.5	206061	o	1.5	-1.86	2.83×10^{07}	0.036
1816.138	136796	e	0.5	191858	o	1.5	-0.70	4.07×10^{08}	0.277
1819.492	160665	e	3.5	215626	o	2.5	-0.44	7.25×10^{08}	0.145
1821.477	141824	e	2.5	196725	o	1.5	-0.42	7.66×10^{08}	0.213
1822.114	141625	e	3.5	196506	o	2.5	-1.25	1.12×10^{08}	0.083
1822.812	177951	e	0.5	232811	o	0.5	-5.37	8.35×10^{03}	0.000
1824.115	146207	e	1.5	201028	o	1.5	-0.91	2.42×10^{08}	0.208
1824.764	165280	e	1.5	220082	o	0.5	-2.22	1.22×10^{07}	0.007
1825.001	165995	e	1.5	220790	o	0.5	-2.62	4.71×10^{06}	0.022
1827.943	161435	e	1.5	216141	o	1.5	-5.61	4.90×10^{03}	0.000
1828.140	141625	e	3.5	196325	o	3.5	-1.75	3.59×10^{07}	0.016
1828.391	146207	e	1.5	200899	o	0.5	-0.59	5.10×10^{08}	0.430
1828.765	141824	e	2.5	196506	o	2.5	-0.85	2.88×10^{08}	0.122
1828.929	125475	e	2.5	180152	o	2.5	-3.13	1.48×10^{06}	0.007
1834.835	141824	e	2.5	196325	o	3.5	-2.73	3.79×10^{06}	0.002
1841.736	136496	e	2.5	190793	o	1.5	-0.12	1.50×10^{09}	0.339
1841.916	145106	e	0.5	199397	o	1.5	-0.78	3.26×10^{08}	0.264
1842.309	146207	e	1.5	200486	o	2.5	-1.98	2.06×10^{07}	0.063
1842.771	148685	e	2.5	202951	o	3.5	-1.38	8.25×10^{07}	0.044
1845.332	161435	e	1.5	215626	o	2.5	-3.52	5.96×10^{05}	0.000
1848.675	159643	e	2.5	213736	o	1.5	-3.13	1.45×10^{06}	0.003
1848.897	165995	e	1.5	220082	o	0.5	-2.49	6.32×10^{06}	0.007
1851.581	170490	e	2.5	224498	o	1.5	-3.40	7.89×10^{05}	0.000
1851.982	136796	e	0.5	190793	o	1.5	-1.94	2.26×10^{07}	0.025
1853.218	141824	e	2.5	195785	o	1.5	-0.64	4.43×10^{08}	0.192
1854.190	145011	e	3.5	198943	o	2.5	-1.63	4.62×10^{07}	0.019
1859.545	163463	e	4.5	217240	o	3.5	0.05	2.15×10^{09}	0.412
1860.811	134981	e	1.5	188721	o	2.5	-0.46	6.64×10^{08}	0.161
1861.445	165280	e	1.5	219002	o	2.5	-3.87	2.66×10^{05}	0.000
1866.250	167206	e	0.5	220790	o	0.5	-1.85	2.62×10^{07}	0.063
1872.564	150737	e	0.5	204140	o	1.5	-2.97	2.04×10^{06}	0.003
1874.548	136496	e	2.5	189842	o	3.5	-1.62	4.56×10^{07}	0.018
1875.680	163597	e	1.5	216911	o	2.5	-1.64	4.41×10^{07}	0.077
1877.071	162867	e	0.5	216141	o	1.5	-2.29	9.65×10^{06}	0.006
1880.035	146207	e	1.5	199397	o	1.5	-2.77	3.23×10^{06}	0.002
1883.888	133027	e	1.5	186109	o	0.5	-0.36	8.27×10^{08}	0.433
1886.565	165995	e	1.5	219002	o	2.5	-1.72	3.69×10^{07}	0.018
1887.159	182571	e	1.5	235561	o	1.5	-2.04	1.61×10^{07}	0.019
1889.163	176042	e	2.5	228975	o	3.5	-1.87	2.54×10^{07}	0.005
1891.246	167206	e	0.5	220082	o	0.5	-2.63	4.27×10^{06}	0.006
1895.476	155864	e	3.5	208621	o	2.5	-0.59	4.83×10^{08}	0.159
1896.216	146207	e	1.5	198943	o	2.5	-1.35	8.37×10^{07}	0.101
1903.156	163597	e	1.5	216141	o	1.5	-2.17	1.25×10^{07}	0.006
1910.490	148685	e	2.5	201028	o	1.5	-0.72	3.44×10^{08}	0.177
1912.013	161435	e	1.5	213736	o	1.5	-3.70	3.64×10^{05}	0.000
1914.803	136496	e	2.5	188721	o	2.5	-1.48	5.95×10^{07}	0.042
1917.961	157205	e	0.5	209344	o	0.5	-2.02	1.71×10^{07}	0.009
1922.012	163597	e	1.5	215626	o	2.5	-2.13	1.37×10^{07}	0.006
1930.457	148685	e	2.5	200486	o	2.5	-3.85	2.52×10^{05}	0.000
1936.832	165280	e	1.5	216911	o	2.5	-3.81	2.74×10^{05}	0.000
1937.264	145106	e	0.5	196725	o	1.5	-1.96	1.95×10^{07}	0.020

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1937.759	172892	e	0.5	224498	o	1.5	-1.90	2.33 × 10 ⁰⁷	0.013
1939.902	145106	e	0.5	196655	o	0.5	-1.71	3.42 × 10 ⁰⁷	0.085
1941.940	145011	e	3.5	196506	o	2.5	-1.68	3.72 × 10 ⁰⁷	0.036
1948.786	145011	e	3.5	196325	o	3.5	-0.59	4.65 × 10 ⁰⁸	0.188
1950.215	173222	e	1.5	224498	o	1.5	-1.76	3.17 × 10 ⁰⁷	0.005
1953.404	155864	e	3.5	207057	o	2.5	-0.54	5.09 × 10 ⁰⁸	0.114
1955.856	134981	e	1.5	186109	o	0.5	-1.07	1.48 × 10 ⁰⁸	0.092
1958.783	177923	e	3.5	228975	o	3.5	-1.62	4.23 × 10 ⁰⁷	0.030
1959.363	136496	e	2.5	187533	o	3.5	-1.83	2.53 × 10 ⁰⁷	0.006
1964.042	165995	e	1.5	216911	o	2.5	-1.55	4.86 × 10 ⁰⁷	0.017
1965.830	162867	e	0.5	213736	o	1.5	-1.73	3.20 × 10 ⁰⁷	0.032
1966.143	165280	e	1.5	216141	o	1.5	-2.43	6.39 × 10 ⁰⁶	0.001
1966.599	155864	e	3.5	206713	o	3.5	-0.64	3.93 × 10 ⁰⁸	0.133
1971.772	169002	e	2.5	219717	o	3.5	-0.68	3.63 × 10 ⁰⁸	0.050
1971.920	148685	e	2.5	199397	o	1.5	-0.54	5.00 × 10 ⁰⁸	0.244
1973.208	145106	e	0.5	195785	o	1.5	-2.35	7.55 × 10 ⁰⁶	0.009
1979.477	146207	e	1.5	196725	o	1.5	-0.64	3.92 × 10 ⁰⁸	0.204
1982.231	146207	e	1.5	196655	o	0.5	-1.98	1.79 × 10 ⁰⁷	0.032
1985.967	141625	e	3.5	191978	o	2.5	-3.52	5.06 × 10 ⁰⁵	0.001
1986.007	155864	e	3.5	206216	o	4.5	-3.44	6.07 × 10 ⁰⁵	0.000
1986.275	165280	e	1.5	215626	o	2.5	-1.33	7.95 × 10 ⁰⁷	0.019
1986.725	145991	e	4.5	196325	o	3.5	-1.59	4.35 × 10 ⁰⁷	0.099
1988.087	146207	e	1.5	196506	o	2.5	-0.70	3.36 × 10 ⁰⁸	0.103
1988.455	150737	e	0.5	201028	o	1.5	-1.29	8.62 × 10 ⁰⁷	0.094
1989.729	148685	e	2.5	198943	o	2.5	-0.74	3.09 × 10 ⁰⁸	0.144
1990.430	182571	e	1.5	232811	o	0.5	-1.80	2.54 × 10 ⁰⁷	0.036
1993.537	150737	e	0.5	200899	o	0.5	-1.54	4.88 × 10 ⁰⁷	0.097
1993.871	141824	e	2.5	191978	o	2.5	-1.82	2.60 × 10 ⁰⁷	0.028
1994.189	165995	e	1.5	216141	o	1.5	-2.90	2.09 × 10 ⁰⁶	0.001
1994.459	163597	e	1.5	213736	o	1.5	-3.51	5.22 × 10 ⁰⁵	0.000
1998.649	141824	e	2.5	191858	o	1.5	-3.55	4.77 × 10 ⁰⁵	0.000
1999.992	169002	e	2.5	219002	o	2.5	-4.15	1.22 × 10 ⁰⁵	0.000
2000.356	179001	e	2.5	228975	o	3.5	-0.25	9.55 × 10 ⁰⁸	0.179
2014.252	165995	e	1.5	215626	o	2.5	-2.26	9.05 × 10 ⁰⁶	0.004
2016.369	146207	e	1.5	195785	o	1.5	-2.10	1.29 × 10 ⁰⁷	0.008
2019.057	186049	e	2.5	235561	o	1.5	-0.61	4.08 × 10 ⁰⁸	0.277
2025.575	155864	e	3.5	205217	o	3.5	-1.49	5.13 × 10 ⁰⁷	0.018
2026.055	155864	e	3.5	205205	o	2.5	-0.62	3.95 × 10 ⁰⁸	0.168
2027.218	136796	e	0.5	186109	o	0.5	-1.80	2.55 × 10 ⁰⁷	0.044
2030.752	170490	e	2.5	219717	o	3.5	-1.64	3.72 × 10 ⁰⁷	0.005
2041.065	159643	e	2.5	208621	o	2.5	-1.46	5.74 × 10 ⁰⁷	0.062
2041.490	141824	e	2.5	190793	o	1.5	-1.45	5.70 × 10 ⁰⁷	0.028
2042.888	167206	e	0.5	216141	o	1.5	-1.63	3.72 × 10 ⁰⁷	0.016
2046.167	157205	e	0.5	206061	o	1.5	-1.54	4.52 × 10 ⁰⁷	0.046
2050.419	145106	e	0.5	193861	o	0.5	-1.25	8.98 × 10 ⁰⁷	0.222
2054.431	150737	e	0.5	199397	o	1.5	-1.20	1.00 × 10 ⁰⁸	0.096
2060.712	170490	e	2.5	219002	o	2.5	-1.39	6.64 × 10 ⁰⁷	0.050
2063.056	176042	e	2.5	224498	o	1.5	-2.30	8.00 × 10 ⁰⁶	0.003
2063.085	165280	e	1.5	213736	o	1.5	-2.27	8.28 × 10 ⁰⁶	0.004
2066.481	176122	e	1.5	224498	o	1.5	-1.93	1.85 × 10 ⁰⁷	0.006
2072.385	169002	e	2.5	217240	o	3.5	-1.85	2.19 × 10 ⁰⁷	0.003
2073.283	141625	e	3.5	189842	o	3.5	-1.25	8.53 × 10 ⁰⁷	0.091
2080.940	148685	e	2.5	196725	o	1.5	-3.62	3.73 × 10 ⁰⁵	0.000
2081.902	141824	e	2.5	189842	o	3.5	-1.08	1.29 × 10 ⁰⁸	0.041
2082.071	187547	e	1.5	235561	o	1.5	-1.99	1.57 × 10 ⁰⁷	0.022

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2084.581	160665	e	3.5	208621	o	2.5	-1.76	2.69×10^{07}	0.013
2086.618	169002	e	2.5	216911	o	2.5	-1.90	1.96×10^{07}	0.010
2086.626	161435	e	1.5	209344	o	0.5	-1.82	2.32×10^{07}	0.037
2087.123	172892	e	0.5	220790	o	0.5	-1.16	1.08×10^{08}	0.091
2090.462	148685	e	2.5	196506	o	2.5	-1.27	8.28×10^{07}	0.032
2094.001	165995	e	1.5	213736	o	1.5	-2.50	4.76×10^{06}	0.009
2097.789	146207	e	1.5	193861	o	0.5	-1.79	2.45×10^{07}	0.027
2098.401	148685	e	2.5	196325	o	3.5	-0.43	5.72×10^{08}	0.160
2101.587	173222	e	1.5	220790	o	0.5	-1.68	3.26×10^{07}	0.111
2108.422	159643	e	2.5	207057	o	2.5	-0.84	2.22×10^{08}	0.123
2114.028	188273	e	0.5	235561	o	1.5	-1.71	2.95×10^{07}	0.039
2118.450	172892	e	0.5	220082	o	0.5	-0.95	1.71×10^{08}	0.230
2118.584	161435	e	1.5	208621	o	2.5	-1.38	6.18×10^{07}	0.035
2120.692	169002	e	2.5	216141	o	1.5	-2.95	1.68×10^{06}	0.001
2121.386	133027	e	1.5	180152	o	2.5	-0.42	5.66×10^{08}	0.231
2122.489	148685	e	2.5	195785	o	1.5	-1.73	2.79×10^{07}	0.015
2122.660	141625	e	3.5	188721	o	2.5	-3.02	1.38×10^{06}	0.005
2123.048	155864	e	3.5	202951	o	3.5	-1.25	8.48×10^{07}	0.038
2123.811	159643	e	2.5	206713	o	3.5	-1.51	4.68×10^{07}	0.020
2128.487	145011	e	3.5	191978	o	2.5	-2.17	9.96×10^{06}	0.013
2129.934	157205	e	0.5	204140	o	1.5	-4.15	1.04×10^{05}	0.000
2131.696	141824	e	2.5	188721	o	2.5	-1.97	1.59×10^{07}	0.026
2133.352	173222	e	1.5	220082	o	0.5	-1.17	1.03×10^{08}	0.049
2138.249	145106	e	0.5	191858	o	1.5	-0.79	2.36×10^{08}	0.171
2138.391	170490	e	2.5	217240	o	3.5	-2.88	1.92×10^{06}	0.000
2144.005	141625	e	3.5	188252	o	4.5	0.10	1.79×10^{09}	0.302
2144.143	169002	e	2.5	215626	o	2.5	-2.36	6.41×10^{06}	0.002
2147.685	177951	e	0.5	224498	o	1.5	-2.23	8.26×10^{06}	0.004
2148.512	167206	e	0.5	213736	o	1.5	-1.11	1.10×10^{08}	0.211
2150.916	162867	e	0.5	209344	o	0.5	-1.77	2.45×10^{07}	0.056
2153.548	170490	e	2.5	216911	o	2.5	-4.77	2.44×10^{04}	0.000
2153.641	159643	e	2.5	206061	o	1.5	-1.67	3.13×10^{07}	0.062
2154.890	160665	e	3.5	207057	o	2.5	-0.82	2.19×10^{08}	0.081
2163.251	155864	e	3.5	202076	o	4.5	0.08	1.70×10^{09}	0.286
2170.966	160665	e	3.5	206713	o	3.5	-1.82	2.14×10^{07}	0.011
2173.818	150737	e	0.5	196725	o	1.5	-1.79	2.30×10^{07}	0.042
2177.141	150737	e	0.5	196655	o	0.5	-3.27	7.48×10^{05}	0.004
2177.583	141625	e	3.5	187533	o	3.5	-1.09	1.13×10^{08}	0.130
2183.681	173222	e	1.5	219002	o	2.5	-0.95	1.66×10^{08}	0.040
2184.077	146207	e	1.5	191978	o	2.5	-0.60	3.53×10^{08}	0.198
2185.252	163597	e	1.5	209344	o	0.5	-0.92	1.69×10^{08}	0.120
2186.389	136496	e	2.5	182219	o	3.5	-0.03	1.30×10^{09}	0.280
2187.093	141824	e	2.5	187533	o	3.5	-0.08	1.15×10^{09}	0.269
2188.132	145106	e	0.5	190793	o	1.5	-1.48	4.62×10^{07}	0.064
2189.814	146207	e	1.5	191858	o	1.5	-1.29	7.16×10^{07}	0.038
2189.862	170490	e	2.5	216141	o	1.5	-2.63	3.24×10^{06}	0.001
2191.245	161435	e	1.5	207057	o	2.5	-1.85	1.96×10^{07}	0.009
2193.553	159643	e	2.5	205217	o	3.5	-2.92	1.67×10^{06}	0.001
2194.116	159643	e	2.5	205205	o	2.5	-1.85	2.02×10^{07}	0.020
2194.651	160665	e	3.5	206216	o	4.5	0.01	1.41×10^{09}	0.266
2195.658	190031	e	2.5	235561	o	1.5	-0.27	7.39×10^{08}	0.342
2197.227	179001	e	2.5	224498	o	1.5	-0.95	1.60×10^{08}	0.056
2208.548	187547	e	1.5	232811	o	0.5	-1.15	9.76×10^{07}	0.158
2212.121	190369	e	1.5	235561	o	1.5	-1.05	1.19×10^{08}	0.274
2213.125	134981	e	1.5	180152	o	2.5	-0.60	3.34×10^{08}	0.133

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2214.876	170490	e	2.5	215626	o	2.5	-2.34	6.16 × 10 ⁰⁶	0.003
2219.198	150737	e	0.5	195785	o	1.5	-2.60	3.40 × 10 ⁰⁶	0.004
2220.327	163597	e	1.5	208621	o	2.5	-0.55	3.93 × 10 ⁰⁸	0.134
2229.911	145011	e	3.5	189842	o	3.5	-1.27	7.18 × 10 ⁰⁷	0.063
2234.737	169002	e	2.5	213736	o	1.5	-2.51	4.13 × 10 ⁰⁶	0.004
2238.064	176122	e	1.5	220790	o	0.5	-1.17	9.05 × 10 ⁰⁷	0.107
2240.126	161435	e	1.5	206061	o	1.5	-0.89	1.69 × 10 ⁰⁸	0.185
2240.336	155864	e	3.5	200486	o	2.5	-1.35	5.93 × 10 ⁰⁷	0.022
2242.161	146207	e	1.5	190793	o	1.5	-1.73	2.45 × 10 ⁰⁷	0.016
2243.892	160665	e	3.5	205217	o	3.5	-1.25	7.26 × 10 ⁰⁷	0.046
2244.482	160665	e	3.5	205205	o	2.5	-1.03	1.24 × 10 ⁰⁸	0.072
2244.537	188273	e	0.5	232811	o	0.5	-2.20	8.47 × 10 ⁰⁶	0.024
2246.636	159643	e	2.5	204140	o	1.5	-0.82	2.02 × 10 ⁰⁸	0.102
2268.740	165280	e	1.5	209344	o	0.5	-1.11	1.01 × 10 ⁰⁸	0.067
2274.124	176122	e	1.5	220082	o	0.5	-2.24	7.54 × 10 ⁰⁶	0.007
2279.746	145991	e	4.5	189842	o	3.5	-2.71	2.47 × 10 ⁰⁶	0.007
2281.223	157205	e	0.5	201028	o	1.5	-1.81	1.94 × 10 ⁰⁷	0.014
2283.949	161435	e	1.5	205205	o	2.5	-1.13	9.63 × 10 ⁰⁷	0.074
2287.132	145011	e	3.5	188721	o	2.5	-2.64	2.91 × 10 ⁰⁶	0.005
2287.917	157205	e	0.5	200899	o	0.5	-1.71	2.50 × 10 ⁰⁷	0.033
2288.205	173222	e	1.5	216911	o	2.5	-1.30	6.67 × 10 ⁰⁷	0.046
2288.912	176042	e	2.5	219717	o	3.5	-0.67	2.72 × 10 ⁰⁸	0.104
2289.951	136496	e	2.5	180152	o	2.5	-1.35	5.65 × 10 ⁰⁷	0.065
2300.263	163597	e	1.5	207057	o	2.5	-6.16	8.84 × 10 ⁰²	0.000
2306.180	165995	e	1.5	209344	o	0.5	-2.25	6.94 × 10 ⁰⁶	0.008
2306.569	165280	e	1.5	208621	o	2.5	-0.54	3.69 × 10 ⁰⁸	0.119
2308.316	159643	e	2.5	202951	o	3.5	-1.02	1.23 × 10 ⁰⁸	0.157
2309.127	148685	e	2.5	191978	o	2.5	-1.95	1.40 × 10 ⁰⁷	0.009
2311.428	163463	e	4.5	206713	o	3.5	-1.43	4.61 × 10 ⁰⁷	0.077
2311.492	172892	e	0.5	216141	o	1.5	-0.90	1.63 × 10 ⁰⁸	0.148
2311.679	170490	e	2.5	213736	o	1.5	-3.11	9.61 × 10 ⁰⁵	0.003
2311.930	145011	e	3.5	188252	o	4.5	-1.83	1.82 × 10 ⁰⁷	0.013
2314.387	162867	e	0.5	206061	o	1.5	-1.41	4.84 × 10 ⁰⁷	0.110
2315.540	148685	e	2.5	191858	o	1.5	-2.44	4.55 × 10 ⁰⁶	0.004
2318.220	150737	e	0.5	193861	o	0.5	-2.62	2.98 × 10 ⁰⁶	0.010
2320.593	155864	e	3.5	198943	o	2.5	-1.92	1.49 × 10 ⁰⁷	0.010
2327.043	176042	e	2.5	219002	o	2.5	-0.98	1.34 × 10 ⁰⁸	0.049
2328.832	186049	e	2.5	228975	o	3.5	-1.18	8.26 × 10 ⁰⁷	0.183
2329.245	173222	e	1.5	216141	o	1.5	-3.50	4.00 × 10 ⁰⁵	0.000
2331.401	176122	e	1.5	219002	o	2.5	-1.55	3.61 × 10 ⁰⁷	0.020
2333.622	177951	e	0.5	220790	o	0.5	-1.57	3.10 × 10 ⁰⁷	0.030
2338.295	163463	e	4.5	206216	o	4.5	-1.31	5.86 × 10 ⁰⁷	0.043
2340.912	161435	e	1.5	204140	o	1.5	-0.49	3.90 × 10 ⁰⁸	0.294
2345.279	165995	e	1.5	208621	o	2.5	-1.53	3.62 × 10 ⁰⁷	0.027
2351.021	145011	e	3.5	187533	o	3.5	-1.66	2.61 × 10 ⁰⁷	0.035
2351.441	146207	e	1.5	188721	o	2.5	-1.16	8.24 × 10 ⁰⁷	0.077
2354.188	163597	e	1.5	206061	o	1.5	-3.08	1.02 × 10 ⁰⁶	0.001
2355.430	190369	e	1.5	232811	o	0.5	-0.28	6.25 × 10 ⁰⁸	0.559
2357.564	173222	e	1.5	215626	o	2.5	-5.84	1.80 × 10 ⁰³	0.000
2364.126	160665	e	3.5	202951	o	3.5	-2.62	2.93 × 10 ⁰⁶	0.003
2365.542	145991	e	4.5	188252	o	4.5	-1.47	3.91 × 10 ⁰⁷	0.053
2369.394	157205	e	0.5	199397	o	1.5	-1.42	4.50 × 10 ⁰⁷	0.031
2372.470	167206	e	0.5	209344	o	0.5	-0.76	2.02 × 10 ⁰⁸	0.114
2372.853	177951	e	0.5	220082	o	0.5	-0.90	1.42 × 10 ⁰⁸	0.198
2374.149	148685	e	2.5	190793	o	1.5	-1.84	1.71 × 10 ⁰⁷	0.009

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2384.359	182571	e	1.5	224498	o	1.5	-1.13	8.06×10^{07}	0.021
2391.959	177923	e	3.5	219717	o	3.5	-1.85	1.63×10^{07}	0.008
2392.955	165280	e	1.5	207057	o	2.5	-2.14	8.51×10^{06}	0.003
2394.274	163463	e	4.5	205217	o	3.5	-3.98	1.20×10^{05}	0.000
2402.635	163597	e	1.5	205205	o	2.5	-2.31	5.81×10^{06}	0.004
2406.482	145991	e	4.5	187533	o	3.5	-3.00	1.13×10^{06}	0.008
2414.083	160665	e	3.5	202076	o	4.5	-3.81	1.76×10^{05}	0.000
2415.612	159643	e	2.5	201028	o	1.5	-0.74	2.11×10^{08}	0.229
2422.126	162867	e	0.5	204140	o	1.5	-0.81	1.74×10^{08}	0.213
2426.577	176042	e	2.5	217240	o	3.5	-1.55	3.25×10^{07}	0.013
2428.977	148685	e	2.5	189842	o	3.5	-0.41	4.46×10^{08}	0.215
2431.116	150737	e	0.5	191858	o	1.5	-3.19	7.45×10^{05}	0.001
2433.631	177923	e	3.5	219002	o	2.5	-0.65	2.65×10^{08}	0.088
2434.645	165995	e	1.5	207057	o	2.5	-3.59	2.91×10^{05}	0.000
2438.083	145106	e	0.5	186109	o	0.5	-2.55	3.16×10^{06}	0.014
2446.113	176042	e	2.5	216911	o	2.5	-0.95	1.27×10^{08}	0.118
2447.634	159643	e	2.5	200486	o	2.5	-0.78	1.85×10^{08}	0.223
2447.634	172892	e	0.5	213736	o	1.5	-0.78	1.89×10^{08}	0.146
2450.929	176122	e	1.5	216911	o	2.5	-0.84	1.61×10^{08}	0.225
2451.368	165280	e	1.5	206061	o	1.5	-0.55	3.14×10^{08}	0.159
2455.245	179001	e	2.5	219717	o	3.5	-0.40	4.49×10^{08}	0.166
2459.752	155864	e	3.5	196506	o	2.5	-2.14	8.06×10^{06}	0.015
2462.655	141625	e	3.5	182219	o	3.5	-1.85	1.55×10^{07}	0.014
2465.753	163597	e	1.5	204140	o	1.5	-4.04	1.01×10^{05}	0.000
2467.549	173222	e	1.5	213736	o	1.5	-3.40	4.46×10^{05}	0.001
2470.751	155864	e	3.5	196325	o	3.5	-1.26	6.12×10^{07}	0.059
2474.824	141824	e	2.5	182219	o	3.5	-2.25	6.21×10^{06}	0.003
2493.070	176042	e	2.5	216141	o	1.5	-0.39	4.39×10^{08}	0.233
2495.135	165995	e	1.5	206061	o	1.5	-1.26	5.82×10^{07}	0.047
2495.802	150737	e	0.5	190793	o	1.5	-2.61	2.67×10^{06}	0.008
2497.024	148685	e	2.5	188721	o	2.5	-1.51	3.32×10^{07}	0.053
2498.072	176122	e	1.5	216141	o	1.5	-0.29	5.51×10^{08}	0.271
2499.172	179001	e	2.5	219002	o	2.5	-0.99	1.18×10^{08}	0.061
2503.942	165280	e	1.5	205205	o	2.5	-1.24	6.21×10^{07}	0.031
2505.347	146207	e	1.5	186109	o	0.5	-2.12	8.01×10^{06}	0.016
2510.475	160665	e	3.5	200486	o	2.5	-1.09	8.52×10^{07}	0.065
2514.700	159643	e	2.5	199397	o	1.5	-1.11	8.25×10^{07}	0.101
2523.244	169002	e	2.5	208621	o	2.5	-1.47	3.70×10^{07}	0.018
2524.946	161435	e	1.5	201028	o	1.5	-1.50	3.24×10^{07}	0.028
2525.539	176042	e	2.5	215626	o	2.5	-0.94	1.20×10^{08}	0.067
2529.610	157205	e	0.5	196725	o	1.5	-1.76	1.81×10^{07}	0.010
2530.673	176122	e	1.5	215626	o	2.5	-2.03	9.86×10^{06}	0.007
2531.654	163463	e	4.5	202951	o	3.5	-1.45	3.73×10^{07}	0.017
2533.149	161435	e	1.5	200899	o	0.5	-3.31	5.04×10^{05}	0.001
2534.112	157205	e	0.5	196655	o	0.5	-2.68	2.16×10^{06}	0.023
2542.704	177923	e	3.5	217240	o	3.5	-0.61	2.55×10^{08}	0.144
2543.746	159643	e	2.5	198943	o	2.5	-3.63	2.46×10^{05}	0.001
2549.624	165995	e	1.5	205205	o	2.5	-3.05	9.13×10^{05}	0.001
2559.953	161435	e	1.5	200486	o	2.5	-1.10	8.01×10^{07}	0.130
2564.163	177923	e	3.5	216911	o	2.5	-0.96	1.12×10^{08}	0.109
2566.961	190031	e	2.5	228975	o	3.5	-0.43	3.75×10^{08}	0.128
2572.570	165280	e	1.5	204140	o	1.5	-2.72	1.92×10^{06}	0.002
2572.914	167206	e	0.5	206061	o	1.5	-0.69	2.00×10^{08}	0.226
2573.371	148685	e	2.5	187533	o	3.5	-2.30	4.99×10^{06}	0.003
2589.027	163463	e	4.5	202076	o	4.5	-1.46	3.42×10^{07}	0.074

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2591.268	157205	e	0.5	195785	o	1.5	-1.52	3.01×10^{07}	0.035
2594.827	141625	e	3.5	180152	o	2.5	-3.42	3.72×10^{05}	0.004
2600.030	186049	e	2.5	224498	o	1.5	-0.23	5.95×10^{08}	0.271
2608.341	141824	e	2.5	180152	o	2.5	-2.38	4.09×10^{06}	0.011
2611.687	160665	e	3.5	198943	o	2.5	-2.70	1.97×10^{06}	0.005
2614.337	179001	e	2.5	217240	o	3.5	-2.42	3.77×10^{06}	0.002
2615.732	182571	e	1.5	220790	o	0.5	-2.06	7.78×10^{06}	0.019
2617.712	177951	e	0.5	216141	o	1.5	-2.09	7.52×10^{06}	0.009
2619.688	162867	e	0.5	201028	o	1.5	-0.88	1.27×10^{08}	0.224
2620.814	165995	e	1.5	204140	o	1.5	-1.57	2.58×10^{07}	0.018
2621.770	170490	e	2.5	208621	o	2.5	-0.69	1.99×10^{08}	0.208
2626.985	169002	e	2.5	207057	o	2.5	-3.82	1.47×10^{05}	0.000
2628.519	162867	e	0.5	200899	o	0.5	-3.57	2.63×10^{05}	0.002
2633.407	161435	e	1.5	199397	o	1.5	-1.42	3.61×10^{07}	0.042
2637.027	179001	e	2.5	216911	o	2.5	-0.05	8.74×10^{08}	0.452
2650.915	169002	e	2.5	206713	o	3.5	-1.65	2.16×10^{07}	0.016
2651.576	177923	e	3.5	215626	o	2.5	-0.24	5.44×10^{08}	0.260
2652.174	176042	e	2.5	213736	o	1.5	-1.32	4.55×10^{07}	0.057
2657.836	176122	e	1.5	213736	o	1.5	-1.37	4.04×10^{07}	0.028
2665.120	182571	e	1.5	220082	o	0.5	-0.09	6.99×10^{08}	0.545
2665.277	161435	e	1.5	198943	o	2.5	-1.50	2.97×10^{07}	0.050
2670.795	163597	e	1.5	201028	o	1.5	-1.41	3.68×10^{07}	0.053
2679.975	163597	e	1.5	200899	o	0.5	-0.99	9.68×10^{07}	0.355
2686.803	145011	e	3.5	182219	o	3.5	-3.07	8.05×10^{05}	0.001
2691.679	179001	e	2.5	216141	o	1.5	-0.91	1.17×10^{08}	0.075
2695.919	159643	e	2.5	196725	o	1.5	-1.05	8.30×10^{07}	0.160
2697.548	169002	e	2.5	206061	o	1.5	-0.13	6.82×10^{08}	0.403
2705.462	187547	e	1.5	224498	o	1.5	0.08	1.10×10^{09}	0.364
2706.759	167206	e	0.5	204140	o	1.5	-0.50	2.81×10^{08}	0.227
2709.995	163597	e	1.5	200486	o	2.5	-5.26	5.09×10^{03}	0.000
2711.921	159643	e	2.5	196506	o	2.5	-0.99	9.43×10^{07}	0.183
2725.296	159643	e	2.5	196325	o	3.5	-0.79	1.50×10^{08}	0.197
2727.288	157205	e	0.5	193861	o	0.5	-1.63	2.08×10^{07}	0.024
2729.567	179001	e	2.5	215626	o	2.5	-2.88	1.21×10^{06}	0.001
2733.949	170490	e	2.5	207057	o	2.5	-0.27	4.84×10^{08}	0.259
2736.629	162867	e	0.5	199397	o	1.5	-2.38	3.71×10^{06}	0.009
2742.560	172892	e	0.5	209344	o	0.5	-2.59	2.34×10^{06}	0.008
2744.126	182571	e	1.5	219002	o	2.5	-0.12	6.38×10^{08}	0.278
2759.480	145991	e	4.5	182219	o	3.5	-4.62	2.10×10^{04}	0.000
2759.663	188273	e	0.5	224498	o	1.5	-0.82	1.36×10^{08}	0.183
2759.877	170490	e	2.5	206713	o	3.5	-2.76	1.54×10^{06}	0.007
2760.456	169002	e	2.5	205217	o	3.5	-0.08	7.25×10^{08}	0.255
2761.348	169002	e	2.5	205205	o	2.5	-2.59	2.33×10^{06}	0.002
2766.062	159643	e	2.5	195785	o	1.5	-2.57	2.38×10^{06}	0.006
2767.586	173222	e	1.5	209344	o	0.5	-0.21	5.61×10^{08}	0.463
2768.176	155864	e	3.5	191978	o	2.5	-5.10	6.90×10^{03}	0.000
2789.278	160665	e	3.5	196506	o	2.5	-3.12	6.56×10^{05}	0.003
2792.449	163597	e	1.5	199397	o	1.5	-1.50	2.78×10^{07}	0.050
2793.682	177951	e	0.5	213736	o	1.5	-1.31	3.92×10^{07}	0.069
2796.566	165280	e	1.5	201028	o	1.5	-0.73	1.56×10^{08}	0.131
2803.428	160665	e	3.5	196325	o	3.5	-2.52	2.63×10^{06}	0.009
2806.632	165280	e	1.5	200899	o	0.5	-1.89	1.08×10^{07}	0.018
2810.459	170490	e	2.5	206061	o	1.5	-4.37	3.62×10^{04}	0.000
2824.083	173222	e	1.5	208621	o	2.5	-0.39	3.61×10^{08}	0.226
2826.279	150737	e	0.5	186109	o	0.5	-2.29	4.27×10^{06}	0.025

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2828.310	163597	e	1.5	198943	o	2.5	-3.36	3.77×10^{05}	0.003
2832.815	161435	e	1.5	196725	o	1.5	-4.90	1.04×10^{04}	0.000
2838.461	161435	e	1.5	196655	o	0.5	-1.57	2.20×10^{07}	0.135
2839.574	165280	e	1.5	200486	o	2.5	-1.59	2.12×10^{07}	0.024
2844.899	145011	e	3.5	180152	o	2.5	-3.80	1.32×10^{05}	0.001
2845.045	169002	e	2.5	204140	o	1.5	-2.35	3.70×10^{06}	0.006
2850.488	161435	e	1.5	196506	o	2.5	-0.96	9.13×10^{07}	0.139
2853.670	165995	e	1.5	201028	o	1.5	-0.71	1.57×10^{08}	0.155
2864.152	165995	e	1.5	200899	o	0.5	-0.38	3.39×10^{08}	0.312
2878.088	179001	e	2.5	213736	o	1.5	-2.65	1.85×10^{06}	0.006
2878.809	170490	e	2.5	205217	o	3.5	-0.55	2.24×10^{08}	0.173
2879.779	170490	e	2.5	205205	o	2.5	-0.58	2.16×10^{08}	0.237
2884.890	157205	e	0.5	191858	o	1.5	-0.51	2.46×10^{08}	0.445
2898.466	165995	e	1.5	200486	o	2.5	-0.26	4.36×10^{08}	0.426
2900.417	190031	e	2.5	224498	o	1.5	-0.41	3.12×10^{08}	0.297
2910.364	161435	e	1.5	195785	o	1.5	-0.78	1.29×10^{08}	0.131
2911.229	182571	e	1.5	216911	o	2.5	-0.52	2.16×10^{08}	0.269
2929.211	190369	e	1.5	224498	o	1.5	-1.36	3.30×10^{07}	0.142
2930.233	165280	e	1.5	199397	o	1.5	-0.67	1.66×10^{08}	0.208
2942.203	155864	e	3.5	189842	o	3.5	-3.17	5.26×10^{05}	0.001
2944.682	169002	e	2.5	202951	o	3.5	-3.02	7.72×10^{05}	0.001
2945.081	146207	e	1.5	180152	o	2.5	-3.76	1.32×10^{05}	0.000
2952.614	162867	e	0.5	196725	o	1.5	-2.67	1.67×10^{06}	0.003
2954.673	173222	e	1.5	207057	o	2.5	-0.12	6.07×10^{08}	0.388
2955.862	167206	e	0.5	201028	o	1.5	-0.67	1.56×10^{08}	0.179
2958.749	162867	e	0.5	196655	o	0.5	-1.09	6.17×10^{07}	0.159
2967.109	167206	e	0.5	200899	o	0.5	-0.56	2.03×10^{08}	0.474
2969.251	186049	e	2.5	219717	o	3.5	0.14	1.07×10^{09}	0.416
2969.745	165280	e	1.5	198943	o	2.5	-0.86	1.05×10^{08}	0.178
2970.927	170490	e	2.5	204140	o	1.5	0.06	8.61×10^{08}	0.458
2976.429	157205	e	0.5	190793	o	1.5	0.04	8.30×10^{08}	0.546
2977.981	182571	e	1.5	216141	o	1.5	-1.03	6.29×10^{07}	0.036
2981.169	148685	e	2.5	182219	o	3.5	-4.00	7.59×10^{04}	0.000
2983.661	202055	e	0.5	235561	o	1.5	0.15	1.05×10^{09}	0.603
2992.987	165995	e	1.5	199397	o	1.5	-0.63	1.73×10^{08}	0.214
3007.285	187547	e	1.5	220790	o	0.5	-2.15	5.13×10^{06}	0.026
3009.222	176122	e	1.5	209344	o	0.5	-1.92	8.80×10^{06}	0.040
3013.985	172892	e	0.5	206061	o	1.5	-1.88	1.01×10^{07}	0.034
3017.697	163597	e	1.5	196725	o	1.5	-1.73	1.41×10^{07}	0.032
3024.106	163597	e	1.5	196655	o	0.5	-3.61	1.85×10^{05}	0.003
3024.426	182571	e	1.5	215626	o	2.5	-0.64	1.51×10^{08}	0.085
3033.733	186049	e	2.5	219002	o	2.5	-1.35	3.44×10^{07}	0.073
3034.221	165995	e	1.5	198943	o	2.5	0.18	1.08×10^{09}	0.535
3036.958	162867	e	0.5	195785	o	1.5	-0.94	8.33×10^{07}	0.151
3037.761	163597	e	1.5	196506	o	2.5	-2.85	1.05×10^{06}	0.004
3042.134	163463	e	4.5	196325	o	3.5	-2.64	1.66×10^{06}	0.011
3042.634	155864	e	3.5	188721	o	2.5	-2.54	2.05×10^{06}	0.010
3044.237	173222	e	1.5	206061	o	1.5	-0.04	6.80×10^{08}	0.319
3068.551	176042	e	2.5	208621	o	2.5	-1.17	4.90×10^{07}	0.048
3072.748	187547	e	1.5	220082	o	0.5	-0.99	7.25×10^{07}	0.088
3074.402	188273	e	0.5	220790	o	0.5	-1.30	3.55×10^{07}	0.089
3076.133	176122	e	1.5	208621	o	2.5	-1.52	2.18×10^{07}	0.035
3079.744	170490	e	2.5	202951	o	3.5	0.38	1.75×10^{09}	0.539
3083.059	161435	e	1.5	193861	o	0.5	-2.10	5.58×10^{06}	0.033
3086.676	155864	e	3.5	188252	o	4.5	-2.34	3.12×10^{06}	0.004

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3091.698	159643	e	2.5	191978	o	2.5	-1.22	4.35 × 10 ⁰⁷	0.081
3103.205	159643	e	2.5	191858	o	1.5	-2.17	4.83 × 10 ⁰⁶	0.021
3105.596	167206	e	0.5	199397	o	1.5	-0.85	9.58 × 10 ⁰⁷	0.165
3105.856	163597	e	1.5	195785	o	1.5	-2.70	1.41 × 10 ⁰⁶	0.003
3121.548	169002	e	2.5	201028	o	1.5	-2.13	5.08 × 10 ⁰⁶	0.007
3125.735	173222	e	1.5	205205	o	2.5	-0.74	1.32 × 10 ⁰⁸	0.237
3142.854	188273	e	0.5	220082	o	0.5	-1.61	1.67 × 10 ⁰⁷	0.067
3156.748	155864	e	3.5	187533	o	3.5	-2.42	2.49 × 10 ⁰⁶	0.006
3175.227	169002	e	2.5	200486	o	2.5	-0.83	9.85 × 10 ⁰⁷	0.124
3177.064	148685	e	2.5	180152	o	2.5	-3.79	1.08 × 10 ⁰⁵	0.001
3178.246	187547	e	1.5	219002	o	2.5	-0.94	7.84 × 10 ⁰⁷	0.043
3179.246	165280	e	1.5	196725	o	1.5	-2.28	3.51 × 10 ⁰⁶	0.004
3184.543	177951	e	0.5	209344	o	0.5	-0.93	7.20 × 10 ⁰⁷	0.226
3186.360	165280	e	1.5	196655	o	0.5	-3.53	1.92 × 10 ⁰⁵	0.003
3192.639	160665	e	3.5	191978	o	2.5	-4.10	5.26 × 10 ⁰⁴	0.001
3199.301	172892	e	0.5	204140	o	1.5	-2.46	2.30 × 10 ⁰⁶	0.009
3201.524	165280	e	1.5	196506	o	2.5	-1.53	1.97 × 10 ⁰⁷	0.052
3205.117	186049	e	2.5	217240	o	3.5	0.15	9.35 × 10 ⁰⁸	0.521
3207.842	182571	e	1.5	213736	o	1.5	-1.97	6.14 × 10 ⁰⁶	0.013
3209.376	159643	e	2.5	190793	o	1.5	-1.22	4.01 × 10 ⁰⁷	0.105
3223.347	176042	e	2.5	207057	o	2.5	-1.44	2.39 × 10 ⁰⁷	0.023
3225.489	162867	e	0.5	193861	o	0.5	-1.45	2.29 × 10 ⁰⁷	0.256
3231.714	176122	e	1.5	207057	o	2.5	-1.59	1.65 × 10 ⁰⁷	0.017
3233.408	173222	e	1.5	204140	o	1.5	-2.52	1.98 × 10 ⁰⁶	0.006
3239.285	186049	e	2.5	216911	o	2.5	0.06	7.49 × 10 ⁰⁸	0.305
3250.376	202055	e	0.5	232811	o	0.5	-0.18	4.20 × 10 ⁰⁸	0.617
3253.253	165995	e	1.5	196725	o	1.5	-0.30	3.12 × 10 ⁰⁸	0.319
3256.623	177923	e	3.5	208621	o	2.5	-0.97	6.90 × 10 ⁰⁷	0.088
3259.448	176042	e	2.5	206713	o	3.5	-0.54	1.87 × 10 ⁰⁸	0.123
3260.702	165995	e	1.5	196655	o	0.5	-2.04	5.65 × 10 ⁰⁶	0.233
3273.086	161435	e	1.5	191978	o	2.5	-1.17	4.27 × 10 ⁰⁷	0.059
3273.740	170490	e	2.5	201028	o	1.5	-0.83	9.01 × 10 ⁰⁷	0.150
3276.584	165995	e	1.5	196506	o	2.5	-1.80	9.93 × 10 ⁰⁶	0.063
3277.250	165280	e	1.5	195785	o	1.5	-2.06	5.36 × 10 ⁰⁶	0.008
3285.986	161435	e	1.5	191858	o	1.5	-2.02	6.03 × 10 ⁰⁶	0.015
3286.310	190369	e	1.5	220790	o	0.5	-3.90	7.34 × 10 ⁰⁴	0.001
3289.013	169002	e	2.5	199397	o	1.5	-1.58	1.67 × 10 ⁰⁷	0.049
3303.316	163597	e	1.5	193861	o	0.5	-1.40	2.55 × 10 ⁰⁷	0.196
3310.382	159643	e	2.5	189842	o	3.5	-0.77	1.04 × 10 ⁰⁸	0.111
3322.142	186049	e	2.5	216141	o	1.5	-0.14	4.48 × 10 ⁰⁸	0.381
3330.232	176042	e	2.5	206061	o	1.5	-2.42	2.34 × 10 ⁰⁶	0.005
3332.830	170490	e	2.5	200486	o	2.5	-0.05	5.32 × 10 ⁰⁸	0.408
3338.875	169002	e	2.5	198943	o	2.5	-1.58	1.62 × 10 ⁰⁷	0.108
3339.165	176122	e	1.5	206061	o	1.5	-2.90	7.51 × 10 ⁰⁵	0.001
3355.945	165995	e	1.5	195785	o	1.5	-0.87	7.86 × 10 ⁰⁷	0.161
3364.643	190369	e	1.5	220082	o	0.5	-2.58	1.48 × 10 ⁰⁶	0.025
3367.533	190031	e	2.5	219717	o	3.5	-1.02	5.53 × 10 ⁰⁷	0.071
3375.059	179001	e	2.5	208621	o	2.5	-2.03	5.77 × 10 ⁰⁶	0.010
3380.046	186049	e	2.5	215626	o	2.5	-0.42	2.25 × 10 ⁰⁸	0.393
3386.734	167206	e	0.5	196725	o	1.5	-0.49	1.84 × 10 ⁰⁸	0.228
3394.807	167206	e	0.5	196655	o	0.5	-1.65	1.24 × 10 ⁰⁷	0.214
3404.577	187547	e	1.5	216911	o	2.5	-1.01	5.60 × 10 ⁰⁷	0.104
3405.273	161435	e	1.5	190793	o	1.5	-3.03	5.39 × 10 ⁰⁵	0.001
3426.375	160665	e	3.5	189842	o	3.5	-2.43	2.10 × 10 ⁰⁶	0.008
3426.633	176042	e	2.5	205217	o	3.5	-1.97	6.07 × 10 ⁰⁶	0.005

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3428.008	176042	e	2.5	205205	o	2.5	-1.85	8.37 × 10 ⁰⁶	0.009
3431.514	177923	e	3.5	207057	o	2.5	-0.71	1.11 × 10 ⁰⁸	0.149
3437.473	176122	e	1.5	205205	o	2.5	-1.08	4.85 × 10 ⁰⁷	0.055
3438.064	159643	e	2.5	188721	o	2.5	-2.16	3.93 × 10 ⁰⁶	0.028
3448.275	162867	e	0.5	191858	o	1.5	-1.89	7.46 × 10 ⁰⁶	0.044
3450.715	190031	e	2.5	219002	o	2.5	-3.15	4.16 × 10 ⁰⁵	0.001
3458.415	170490	e	2.5	199397	o	1.5	-4.67	1.21 × 10 ⁰⁴	0.000
3458.726	157205	e	0.5	186109	o	0.5	-0.22	3.33 × 10 ⁰⁸	0.554
3472.458	177923	e	3.5	206713	o	3.5	-1.50	1.77 × 10 ⁰⁷	0.040
3491.548	190369	e	1.5	219002	o	2.5	-1.93	6.43 × 10 ⁰⁶	0.020
3496.224	187547	e	1.5	216141	o	1.5	-0.75	9.64 × 10 ⁰⁷	0.084
3497.876	165280	e	1.5	193861	o	0.5	-1.86	7.56 × 10 ⁰⁶	0.035
3498.170	167206	e	0.5	195785	o	1.5	-1.11	4.15 × 10 ⁰⁷	0.099
3513.588	170490	e	2.5	198943	o	2.5	-0.57	1.46 × 10 ⁰⁸	0.171
3522.427	163597	e	1.5	191978	o	2.5	-1.33	2.64 × 10 ⁰⁷	0.102
3533.446	177923	e	3.5	206216	o	4.5	-0.82	8.18 × 10 ⁰⁷	0.069
3537.372	163597	e	1.5	191858	o	1.5	-3.86	7.67 × 10 ⁰⁴	0.000
3553.226	172892	e	0.5	201028	o	1.5	-1.95	6.08 × 10 ⁰⁶	0.025
3556.424	177951	e	0.5	206061	o	1.5	-1.22	2.94 × 10 ⁰⁷	0.130
3557.943	176042	e	2.5	204140	o	1.5	-1.20	3.36 × 10 ⁰⁷	0.113
3560.414	187547	e	1.5	215626	o	2.5	-0.10	4.16 × 10 ⁰⁸	0.306
3563.270	179001	e	2.5	207057	o	2.5	-1.59	1.40 × 10 ⁰⁷	0.018
3563.346	160665	e	3.5	188721	o	2.5	-4.97	5.47 × 10 ⁰³	0.000
3568.141	176122	e	1.5	204140	o	1.5	-3.72	9.81 × 10 ⁰⁴	0.000
3569.491	172892	e	0.5	200899	o	0.5	-3.05	4.84 × 10 ⁰⁵	0.006
3579.870	162867	e	0.5	190793	o	1.5	-3.07	4.51 × 10 ⁰⁵	0.002
3584.478	159643	e	2.5	187533	o	3.5	-1.53	1.53 × 10 ⁰⁷	0.070
3587.270	188273	e	0.5	216141	o	1.5	-1.18	3.48 × 10 ⁰⁷	0.143
3587.669	165995	e	1.5	193861	o	0.5	-0.51	1.62 × 10 ⁰⁸	0.459
3595.346	173222	e	1.5	201028	o	1.5	-0.83	7.94 × 10 ⁰⁷	0.143
3606.032	169002	e	2.5	196725	o	1.5	-1.01	5.11 × 10 ⁰⁷	0.143
3607.438	179001	e	2.5	206713	o	3.5	-1.67	1.17 × 10 ⁰⁷	0.017
3610.773	186049	e	2.5	213736	o	1.5	-1.53	1.53 × 10 ⁰⁷	0.217
3612.000	173222	e	1.5	200899	o	0.5	-1.20	3.37 × 10 ⁰⁷	0.103
3623.902	160665	e	3.5	188252	o	4.5	-3.44	1.78 × 10 ⁰⁵	0.003
3634.719	169002	e	2.5	196506	o	2.5	-2.66	1.14 × 10 ⁰⁶	0.008
3658.784	169002	e	2.5	196325	o	3.5	-2.24	3.02 × 10 ⁰⁶	0.015
3662.846	177923	e	3.5	205217	o	3.5	-2.65	1.11 × 10 ⁰⁶	0.002
3663.853	161435	e	1.5	188721	o	2.5	-1.77	8.21 × 10 ⁰⁶	0.035
3664.417	177923	e	3.5	205205	o	2.5	-1.43	1.89 × 10 ⁰⁷	0.052
3666.742	173222	e	1.5	200486	o	2.5	-0.33	2.44 × 10 ⁰⁸	0.232
3674.181	190031	e	2.5	217240	o	3.5	-0.83	7.21 × 10 ⁰⁷	0.113
3675.992	163597	e	1.5	190793	o	1.5	-2.04	4.75 × 10 ⁰⁶	0.027
3694.344	179001	e	2.5	206061	o	1.5	-5.10	4.03 × 10 ⁰³	0.000
3715.144	176042	e	2.5	202951	o	3.5	-1.89	6.56 × 10 ⁰⁶	0.018
3719.152	190031	e	2.5	216911	o	2.5	-1.56	1.34 × 10 ⁰⁷	0.094
3720.869	160665	e	3.5	187533	o	3.5	-2.68	9.86 × 10 ⁰⁵	0.005
3732.636	169002	e	2.5	195785	o	1.5	-1.15	3.48 × 10 ⁰⁷	0.138
3734.086	182571	e	1.5	209344	o	0.5	-2.18	2.79 × 10 ⁰⁶	0.012
3744.520	165280	e	1.5	191978	o	2.5	-4.01	4.71 × 10 ⁰⁴	0.000
3750.688	167206	e	0.5	193861	o	0.5	-0.76	8.07 × 10 ⁰⁷	0.270
3761.413	165280	e	1.5	191858	o	1.5	-4.33	2.23 × 10 ⁰⁴	0.000
3766.628	190369	e	1.5	216911	o	2.5	-2.56	1.26 × 10 ⁰⁶	0.085
3771.830	172892	e	0.5	199397	o	1.5	-4.99	5.00 × 10 ⁰³	0.000
3789.818	163463	e	4.5	189842	o	3.5	-2.84	6.72 × 10 ⁰⁵	0.015

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3793.240	155864	e	3.5	182219	o	3.5	-2.85	6.62 × 10 ⁰⁵	0.003
3810.678	170490	e	2.5	196725	o	1.5	-1.59	1.19 × 10 ⁰⁷	0.046
3813.353	179001	e	2.5	205217	o	3.5	-1.35	2.11 × 10 ⁰⁷	0.031
3815.056	179001	e	2.5	205205	o	2.5	-3.24	2.84 × 10 ⁰⁵	0.001
3817.328	177951	e	0.5	204140	o	1.5	-2.67	8.99 × 10 ⁰⁵	0.009
3817.357	187547	e	1.5	213736	o	1.5	-1.48	1.49 × 10 ⁰⁷	0.068
3819.326	173222	e	1.5	199397	o	1.5	-4.41	1.90 × 10 ⁰⁴	0.000
3828.790	190031	e	2.5	216141	o	1.5	-1.74	8.29 × 10 ⁰⁶	0.023
3837.668	182571	e	1.5	208621	o	2.5	-2.64	9.36 × 10 ⁰⁵	0.002
3842.728	170490	e	2.5	196506	o	2.5	-3.28	2.41 × 10 ⁰⁵	0.004
3847.609	165995	e	1.5	191978	o	2.5	-3.17	3.08 × 10 ⁰⁵	0.004
3865.446	165995	e	1.5	191858	o	1.5	-1.94	5.20 × 10 ⁰⁶	0.022
3869.636	170490	e	2.5	196325	o	3.5	-2.96	5.02 × 10 ⁰⁵	0.012
3879.126	190369	e	1.5	216141	o	1.5	-3.12	3.19 × 10 ⁰⁵	0.004
3886.727	173222	e	1.5	198943	o	2.5	-0.84	6.88 × 10 ⁰⁷	0.357
3905.907	190031	e	2.5	215626	o	2.5	-1.01	4.29 × 10 ⁰⁷	0.120
3918.537	165280	e	1.5	190793	o	1.5	-1.48	1.46 × 10 ⁰⁷	0.048
3926.155	188273	e	0.5	213736	o	1.5	-2.25	2.44 × 10 ⁰⁶	0.025
3952.341	170490	e	2.5	195785	o	1.5	-2.69	8.66 × 10 ⁰⁵	0.007
3958.304	190369	e	1.5	215626	o	2.5	-4.33	1.92 × 10 ⁰⁴	0.000
3976.679	179001	e	2.5	204140	o	1.5	-1.25	2.48 × 10 ⁰⁷	0.069
3979.148	163597	e	1.5	188721	o	2.5	-1.56	1.17 × 10 ⁰⁷	0.044
3994.427	177923	e	3.5	202951	o	3.5	-1.47	1.46 × 10 ⁰⁷	0.061
4001.158	176042	e	2.5	201028	o	1.5	-1.65	9.30 × 10 ⁰⁶	0.028
4014.059	176122	e	1.5	201028	o	1.5	-1.73	7.63 × 10 ⁰⁶	0.030
4031.574	165995	e	1.5	190793	o	1.5	-1.59	1.07 × 10 ⁰⁷	0.020
4032.957	163463	e	4.5	188252	o	4.5	-3.68	8.23 × 10 ⁰⁴	0.002
4034.828	176122	e	1.5	200899	o	0.5	-1.70	8.31 × 10 ⁰⁶	0.092
4051.639	161435	e	1.5	186109	o	0.5	-1.81	6.21 × 10 ⁰⁶	0.067
4055.353	167206	e	0.5	191858	o	1.5	-1.90	5.06 × 10 ⁰⁶	0.037
4082.880	182571	e	1.5	207057	o	2.5	-1.80	5.57 × 10 ⁰⁶	0.011
4089.779	176042	e	2.5	200486	o	2.5	-3.33	1.92 × 10 ⁰⁵	0.001
4103.258	176122	e	1.5	200486	o	2.5	-1.73	7.47 × 10 ⁰⁶	0.037
4116.166	155864	e	3.5	180152	o	2.5	-3.11	3.04 × 10 ⁰⁵	0.010
4139.139	177923	e	3.5	202076	o	4.5	-1.32	1.90 × 10 ⁰⁷	0.037
4153.413	163463	e	4.5	187533	o	3.5	-4.89	4.87 × 10 ⁰³	0.000
4174.084	179001	e	2.5	202951	o	3.5	-1.15	2.98 × 10 ⁰⁷	0.052
4194.734	172892	e	0.5	196725	o	1.5	-2.71	7.71 × 10 ⁰⁵	0.005
4207.126	172892	e	0.5	196655	o	0.5	-2.72	7.53 × 10 ⁰⁵	0.013
4217.314	190031	e	2.5	213736	o	1.5	-2.19	2.38 × 10 ⁰⁶	0.020
4238.592	167206	e	0.5	190793	o	1.5	-2.46	1.27 × 10 ⁰⁶	0.004
4253.560	173222	e	1.5	196725	o	1.5	-1.22	2.36 × 10 ⁰⁷	0.075
4255.896	182571	e	1.5	206061	o	1.5	-1.61	7.73 × 10 ⁰⁶	0.015
4264.902	165280	e	1.5	188721	o	2.5	-1.77	6.06 × 10 ⁰⁶	0.027
4266.303	173222	e	1.5	196655	o	0.5	-4.20	2.47 × 10 ⁰⁴	0.004
4278.464	190369	e	1.5	213736	o	1.5	-2.84	4.95 × 10 ⁰⁵	0.007
4280.515	176042	e	2.5	199397	o	1.5	-1.59	9.60 × 10 ⁰⁶	0.057
4293.531	173222	e	1.5	196506	o	2.5	-2.25	2.20 × 10 ⁰⁶	0.062
4295.284	176122	e	1.5	199397	o	1.5	-5.24	2.10 × 10 ⁰³	0.000
4301.235	162867	e	0.5	186109	o	0.5	-2.11	2.80 × 10 ⁰⁶	0.072
4332.195	177951	e	0.5	201028	o	1.5	-2.14	2.33 × 10 ⁰⁶	0.021
4351.031	169002	e	2.5	191978	o	2.5	-1.96	4.01 × 10 ⁰⁶	0.046
4356.397	177951	e	0.5	200899	o	0.5	-5.40	1.29 × 10 ⁰³	0.000
4365.356	176042	e	2.5	198943	o	2.5	-2.27	1.96 × 10 ⁰⁶	0.026
4367.035	172892	e	0.5	195785	o	1.5	-3.18	2.40 × 10 ⁰⁵	0.001

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
4373.856	169002	e	2.5	191858	o	1.5	-3.34	1.66 × 10 ⁰⁵	0.003
4380.717	176122	e	1.5	198943	o	2.5	-1.85	4.95 × 10 ⁰⁶	0.053
4399.146	165995	e	1.5	188721	o	2.5	-5.18	2.22 × 10 ⁰³	0.000
4416.892	182571	e	1.5	205205	o	2.5	-1.28	1.58 × 10 ⁰⁷	0.066
4428.180	159643	e	2.5	182219	o	3.5	-1.65	7.94 × 10 ⁰⁶	0.041
4428.926	186049	e	2.5	208621	o	2.5	-2.29	1.85 × 10 ⁰⁶	0.011
4430.810	177923	e	3.5	200486	o	2.5	-1.26	1.87 × 10 ⁰⁷	0.048
4430.830	173222	e	1.5	195785	o	1.5	-2.40	1.45 × 10 ⁰⁶	0.009
4440.750	163597	e	1.5	186109	o	0.5	-1.59	9.06 × 10 ⁰⁶	0.079
4454.363	202055	e	0.5	224498	o	1.5	-2.82	5.18 × 10 ⁰⁵	0.008
4538.590	179001	e	2.5	201028	o	1.5	-2.82	5.08 × 10 ⁰⁵	0.004
4586.544	187547	e	1.5	209344	o	0.5	-1.51	9.57 × 10 ⁰⁶	0.044
4587.765	169002	e	2.5	190793	o	1.5	-1.66	7.30 × 10 ⁰⁶	0.080
4634.985	182571	e	1.5	204140	o	1.5	-3.11	2.00 × 10 ⁰⁵	0.002
4638.211	160665	e	3.5	182219	o	3.5	-3.37	1.34 × 10 ⁰⁵	0.003
4652.501	170490	e	2.5	191978	o	2.5	-3.64	7.21 × 10 ⁰⁴	0.004
4652.956	179001	e	2.5	200486	o	2.5	-2.38	1.36 × 10 ⁰⁶	0.005
4661.591	177951	e	0.5	199397	o	1.5	-1.63	6.55 × 10 ⁰⁶	0.089
4678.607	170490	e	2.5	191858	o	1.5	-4.02	3.00 × 10 ⁰⁴	0.000
4743.812	187547	e	1.5	208621	o	2.5	-2.21	1.86 × 10 ⁰⁶	0.006
4744.510	188273	e	0.5	209344	o	0.5	-1.59	7.73 × 10 ⁰⁶	0.140
4756.089	177923	e	3.5	198943	o	2.5	-3.00	3.00 × 10 ⁰⁵	0.007
4758.761	186049	e	2.5	207057	o	2.5	-2.14	2.20 × 10 ⁰⁶	0.007
4767.748	172892	e	0.5	193861	o	0.5	-2.15	2.23 × 10 ⁰⁶	0.066
4796.985	169002	e	2.5	189842	o	3.5	-3.12	2.30 × 10 ⁰⁵	0.002
4799.634	165280	e	1.5	186109	o	0.5	-4.52	8.81 × 10 ⁰³	0.000
4833.538	176042	e	2.5	196725	o	1.5	-2.04	2.66 × 10 ⁰⁶	0.015
4837.865	186049	e	2.5	206713	o	3.5	-2.46	1.04 × 10 ⁰⁶	0.027
4843.889	173222	e	1.5	193861	o	0.5	-1.32	1.46 × 10 ⁰⁷	0.110
4852.377	176122	e	1.5	196725	o	1.5	-2.87	3.84 × 10 ⁰⁵	0.002
4868.967	176122	e	1.5	196655	o	0.5	-4.48	9.23 × 10 ⁰³	0.001
4874.618	159643	e	2.5	180152	o	2.5	-3.19	1.85 × 10 ⁰⁵	0.014
4885.218	176042	e	2.5	196506	o	2.5	-3.08	2.44 × 10 ⁰⁵	0.002
4901.433	179001	e	2.5	199397	o	1.5	-4.26	1.62 × 10 ⁰⁴	0.000
4904.463	176122	e	1.5	196506	o	2.5	-2.24	1.65 × 10 ⁰⁶	0.010
4924.200	170490	e	2.5	190793	o	1.5	-2.54	8.10 × 10 ⁰⁵	0.006
4928.788	176042	e	2.5	196325	o	3.5	-1.79	4.73 × 10 ⁰⁶	0.029
4970.324	165995	e	1.5	186109	o	0.5	-3.14	1.94 × 10 ⁰⁵	0.001
4995.458	186049	e	2.5	206061	o	1.5	-2.53	8.18 × 10 ⁰⁵	0.005
5012.993	179001	e	2.5	198943	o	2.5	-2.42	1.08 × 10 ⁰⁶	0.008
5063.751	176042	e	2.5	195785	o	1.5	-2.52	8.08 × 10 ⁰⁵	0.007
5069.812	169002	e	2.5	188721	o	2.5	-1.85	3.67 × 10 ⁰⁶	0.038
5084.432	176122	e	1.5	195785	o	1.5	-3.58	6.79 × 10 ⁰⁴	0.001
5124.227	187547	e	1.5	207057	o	2.5	-3.03	2.36 × 10 ⁰⁵	0.001
5130.355	160665	e	3.5	180152	o	2.5	-3.40	1.01 × 10 ⁰⁵	0.009
5166.039	170490	e	2.5	189842	o	3.5	-3.57	6.76 × 10 ⁰⁴	0.004
5215.549	186049	e	2.5	205217	o	3.5	-2.36	1.08 × 10 ⁰⁶	0.007
5218.734	186049	e	2.5	205205	o	2.5	-3.61	6.45 × 10 ⁰⁴	0.001
5268.792	190369	e	1.5	209344	o	0.5	-1.38	9.27 × 10 ⁰⁶	0.149
5271.126	172892	e	0.5	191858	o	1.5	-2.73	4.83 × 10 ⁰⁵	0.008
5288.778	167206	e	0.5	186109	o	0.5	-2.48	7.60 × 10 ⁰⁵	0.006
5325.091	177951	e	0.5	196725	o	1.5	-2.27	1.16 × 10 ⁰⁶	0.026
5330.059	173222	e	1.5	191978	o	2.5	-2.65	5.71 × 10 ⁰⁵	0.046
5330.144	163463	e	4.5	182219	o	3.5	-5.11	1.85 × 10 ⁰³	0.000
5336.062	202055	e	0.5	220790	o	0.5	-2.80	3.64 × 10 ⁰⁵	0.063

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
5341.308	161435	e	1.5	180152	o	2.5	-3.00	2.30 × 10 ⁰⁵	0.007
5345.077	177951	e	0.5	196655	o	0.5	-4.53	6.18 × 10 ⁰³	0.001
5364.351	173222	e	1.5	191858	o	1.5	-2.59	6.55 × 10 ⁰⁵	0.023
5377.567	190031	e	2.5	208621	o	2.5	-1.81	3.70 × 10 ⁰⁶	0.023
5379.824	177923	e	3.5	196506	o	2.5	-2.09	1.93 × 10 ⁰⁶	0.062
5394.746	169002	e	2.5	187533	o	3.5	-3.45	8.23 × 10 ⁰⁴	0.001
5399.729	187547	e	1.5	206061	o	1.5	-2.42	8.49 × 10 ⁰⁵	0.002
5416.610	182571	e	1.5	201028	o	1.5	-2.15	1.32 × 10 ⁰⁶	0.012
5432.711	177923	e	3.5	196325	o	3.5	-2.30	1.21 × 10 ⁰⁶	0.020
5454.498	182571	e	1.5	200899	o	0.5	-2.39	7.62 × 10 ⁰⁵	0.016
5477.390	190369	e	1.5	208621	o	2.5	-2.26	1.18 × 10 ⁰⁶	0.007
5483.849	170490	e	2.5	188721	o	2.5	-2.55	6.08 × 10 ⁰⁵	0.053
5525.953	186049	e	2.5	204140	o	1.5	-2.64	5.15 × 10 ⁰⁵	0.002
5545.694	202055	e	0.5	220082	o	0.5	-1.91	2.68 × 10 ⁰⁶	0.113
5580.303	182571	e	1.5	200486	o	2.5	-2.87	2.36 × 10 ⁰⁵	0.002
5584.948	172892	e	0.5	190793	o	1.5	-5.80	3.68 × 10 ⁰²	0.000
5605.868	177951	e	0.5	195785	o	1.5	-1.91	2.34 × 10 ⁰⁶	0.045
5620.018	188273	e	0.5	206061	o	1.5	-3.48	7.01 × 10 ⁰⁴	0.002
5635.923	176122	e	1.5	193861	o	0.5	-3.26	1.18 × 10 ⁰⁵	0.006
5640.374	179001	e	2.5	196725	o	1.5	-6.89	2.91 × 10 ⁰¹	0.000
5661.552	187547	e	1.5	205205	o	2.5	-3.11	1.64 × 10 ⁰⁵	0.002
5689.714	173222	e	1.5	190793	o	1.5	-2.53	6.68 × 10 ⁰⁵	0.012
5710.873	179001	e	2.5	196506	o	2.5	-3.21	1.40 × 10 ⁰⁵	0.003
5770.505	179001	e	2.5	196325	o	3.5	-2.65	5.06 × 10 ⁰⁵	0.004
5866.023	170490	e	2.5	187533	o	3.5	-4.16	1.33 × 10 ⁰⁴	0.002
5871.708	190031	e	2.5	207057	o	2.5	-2.81	3.03 × 10 ⁰⁵	0.003
5914.645	186049	e	2.5	202951	o	3.5	-3.07	1.77 × 10 ⁰⁵	0.000
5941.537	182571	e	1.5	199397	o	1.5	-2.90	1.95 × 10 ⁰⁵	0.006
5956.370	179001	e	2.5	195785	o	1.5	-5.16	1.39 × 10 ⁰³	0.000
5990.922	190369	e	1.5	207057	o	2.5	-4.87	2.37 × 10 ⁰³	0.000
5992.610	190031	e	2.5	206713	o	3.5	-2.23	1.12 × 10 ⁰⁶	0.007
6024.933	187547	e	1.5	204140	o	1.5	-3.06	1.55 × 10 ⁰⁵	0.003
6038.872	163597	e	1.5	180152	o	2.5	-3.11	1.50 × 10 ⁰⁵	0.003
6106.261	182571	e	1.5	198943	o	2.5	-3.44	5.32 × 10 ⁰⁴	0.001
6236.305	190031	e	2.5	206061	o	1.5	-1.86	2.34 × 10 ⁰⁶	0.030
6269.628	186109	o	0.5	202055	e	0.5	-4.15	1.21 × 10 ⁰⁴	0.000
6273.286	176042	e	2.5	191978	o	2.5	-4.27	9.51 × 10 ⁰³	0.000
6283.815	177951	e	0.5	193861	o	0.5	-2.55	4.26 × 10 ⁰⁵	0.035
6300.487	188273	e	0.5	204140	o	1.5	-2.71	3.29 × 10 ⁰⁵	0.013
6305.057	176122	e	1.5	191978	o	2.5	-2.66	3.72 × 10 ⁰⁵	0.008
6320.843	176042	e	2.5	191858	o	1.5	-3.12	1.36 × 10 ⁰⁵	0.004
6353.098	176122	e	1.5	191858	o	1.5	-2.79	2.80 × 10 ⁰⁵	0.008
6370.953	190369	e	1.5	206061	o	1.5	-2.10	1.21 × 10 ⁰⁶	0.073
6450.330	173222	e	1.5	188721	o	2.5	-2.27	9.21 × 10 ⁰⁵	0.069
6583.107	190031	e	2.5	205217	o	3.5	-2.62	3.55 × 10 ⁰⁵	0.003
6588.183	190031	e	2.5	205205	o	2.5	-3.54	4.57 × 10 ⁰⁴	0.001
6674.170	186049	e	2.5	201028	o	1.5	-3.20	9.78 × 10 ⁰⁴	0.002
6722.415	165280	e	1.5	180152	o	2.5	-2.95	1.65 × 10 ⁰⁵	0.006
6738.637	190369	e	1.5	205205	o	2.5	-1.94	1.60 × 10 ⁰⁶	0.040
6777.514	176042	e	2.5	190793	o	1.5	-2.07	1.32 × 10 ⁰⁶	0.029
6814.612	176122	e	1.5	190793	o	1.5	-6.45	5.31 × 10 ⁰¹	0.000
6924.449	186049	e	2.5	200486	o	2.5	-1.92	1.74 × 10 ⁰⁶	0.012
7062.095	165995	e	1.5	180152	o	2.5	-4.73	2.43 × 10 ⁰³	0.001
7063.243	182571	e	1.5	196725	o	1.5	-3.33	4.91 × 10 ⁰⁴	0.001
7085.470	190031	e	2.5	204140	o	1.5	-5.18	8.45 × 10 ⁰²	0.000

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
7097.089	202055	e	0.5	216141	o	1.5	-2.31	6.45 × 10 ⁰⁵	0.029
7098.450	182571	e	1.5	196655	o	0.5	-4.22	6.24 × 10 ⁰³	0.003
7113.046	177923	e	3.5	191978	o	2.5	-3.54	3.93 × 10 ⁰⁴	0.003
7174.146	182571	e	1.5	196506	o	2.5	-3.58	2.75 × 10 ⁰⁴	0.002
7188.590	177951	e	0.5	191858	o	1.5	-2.90	1.48 × 10 ⁰⁵	0.019
7244.275	176042	e	2.5	189842	o	3.5	-2.73	2.48 × 10 ⁰⁵	0.003
7259.794	190369	e	1.5	204140	o	1.5	-3.16	7.83 × 10 ⁰⁴	0.011
7415.970	187547	e	1.5	201028	o	1.5	-2.55	3.27 × 10 ⁰⁵	0.006
7487.172	187547	e	1.5	200899	o	0.5	-3.52	3.54 × 10 ⁰⁴	0.001
7489.472	186049	e	2.5	199397	o	1.5	-5.00	1.25 × 10 ⁰³	0.000
7563.587	169002	e	2.5	182219	o	3.5	-3.29	6.53 × 10 ⁰⁴	0.005
7563.988	172892	e	0.5	186109	o	0.5	-3.36	5.53 × 10 ⁰⁴	0.006
7565.877	182571	e	1.5	195785	o	1.5	-5.04	8.23 × 10 ⁰²	0.000
7703.465	179001	e	2.5	191978	o	2.5	-4.22	7.60 × 10 ⁰³	0.000
7726.267	187547	e	1.5	200486	o	2.5	-2.47	3.68 × 10 ⁰⁵	0.004
7737.449	190031	e	2.5	202951	o	3.5	-6.04	1.09 × 10 ⁰²	0.000
7753.111	186049	e	2.5	198943	o	2.5	-3.46	4.18 × 10 ⁰⁴	0.001
7757.442	173222	e	1.5	186109	o	0.5	-2.19	8.02 × 10 ⁰⁵	0.021
7775.301	179001	e	2.5	191858	o	1.5	-5.06	1.10 × 10 ⁰³	0.000
7785.170	177951	e	0.5	190793	o	1.5	-2.71	1.91 × 10 ⁰⁵	0.030
7837.906	188273	e	0.5	201028	o	1.5	-2.84	1.57 × 10 ⁰⁵	0.012
7885.075	176042	e	2.5	188721	o	2.5	-3.00	1.08 × 10 ⁰⁵	0.005
7917.485	188273	e	0.5	200899	o	0.5	-4.03	1.01 × 10 ⁰⁴	0.002
7935.333	176122	e	1.5	188721	o	2.5	-3.87	1.40 × 10 ⁰⁴	0.001
8387.801	177923	e	3.5	189842	o	3.5	-4.25	5.54 × 10 ⁰³	0.001
8436.429	187547	e	1.5	199397	o	1.5	-2.76	1.59 × 10 ⁰⁵	0.010
8477.996	179001	e	2.5	190793	o	1.5	-5.58	2.77 × 10 ⁰²	0.000
8523.679	170490	e	2.5	182219	o	3.5	-5.83	1.42 × 10 ⁰²	0.000
8558.559	202055	e	0.5	213736	o	1.5	-6.61	2.18 × 10 ⁰¹	0.000
8700.073	176042	e	2.5	187533	o	3.5	-3.91	1.11 × 10 ⁰⁴	0.000
8772.445	187547	e	1.5	198943	o	2.5	-3.88	1.13 × 10 ⁰⁴	0.001
8855.278	182571	e	1.5	193861	o	0.5	-2.27	3.45 × 10 ⁰⁵	0.044
8966.148	169002	e	2.5	180152	o	2.5	-3.02	8.30 × 10 ⁰⁴	0.015
8986.782	188273	e	0.5	199397	o	1.5	-2.79	1.38 × 10 ⁰⁵	0.015
9090.811	190031	e	2.5	201028	o	1.5	-2.81	1.21 × 10 ⁰⁵	0.007
9221.200	179001	e	2.5	189842	o	3.5	-4.64	2.06 × 10 ⁰³	0.000
9259.034	177923	e	3.5	188721	o	2.5	-2.42	2.91 × 10 ⁰⁵	0.027
9363.971	186049	e	2.5	196725	o	1.5	-3.44	2.99 × 10 ⁰⁴	0.002
9379.786	190369	e	1.5	201028	o	1.5	-2.56	1.79 × 10 ⁰⁵	0.026
9493.981	190369	e	1.5	200899	o	0.5	-2.65	1.50 × 10 ⁰⁵	0.071
9559.892	186049	e	2.5	196506	o	2.5	-4.55	2.31 × 10 ⁰³	0.001
9561.538	190031	e	2.5	200486	o	2.5	-2.20	4.58 × 10 ⁰⁵	0.031
9679.293	177923	e	3.5	188252	o	4.5	-3.26	3.81 × 10 ⁰⁴	0.007
9728.177	186049	e	2.5	196325	o	3.5	-4.05	7.29 × 10 ⁰³	0.003
9784.159	180152	o	2.5	190369	e	1.5	-4.10	6.18 × 10 ⁰³	0.001
9804.694	191858	o	1.5	202055	e	0.5	-4.48	2.23 × 10 ⁰³	0.001
9881.741	190369	e	1.5	200486	o	2.5	-3.03	5.57 × 10 ⁰⁴	0.028
10010.373	176122	e	1.5	186109	o	0.5	-3.17	4.57 × 10 ⁰⁴	0.011
10119.708	180152	o	2.5	190031	e	2.5	-4.62	1.58 × 10 ⁰³	0.000
10268.344	186049	e	2.5	195785	o	1.5	-4.47	2.32 × 10 ⁰³	0.001
10285.141	179001	e	2.5	188721	o	2.5	-4.73	1.28 × 10 ⁰³	0.000
10347.845	170490	e	2.5	180152	o	2.5	-3.99	6.29 × 10 ⁰³	0.015
10403.409	177923	e	3.5	187533	o	3.5	-5.57	1.62 × 10 ⁰²	0.000
10627.357	182571	e	1.5	191978	o	2.5	-3.26	2.29 × 10 ⁰⁴	0.005
10673.422	190031	e	2.5	199397	o	1.5	-2.90	7.34 × 10 ⁰⁴	0.010

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
10764.559	182571	e	1.5	191858	o	1.5	-4.45	1.47 × 10 ⁰³	0.001
10892.636	187547	e	1.5	196725	o	1.5	-3.29	2.82 × 10 ⁰⁴	0.002
10976.593	187547	e	1.5	196655	o	0.5	-5.68	1.10 × 10 ⁰²	0.000
11073.985	190369	e	1.5	199397	o	1.5	-2.31	2.34 × 10 ⁰⁵	0.054
11158.655	187547	e	1.5	196506	o	2.5	-3.48	1.81 × 10 ⁰⁴	0.005
11216.999	190031	e	2.5	198943	o	2.5	-4.83	8.06 × 10 ⁰²	0.001
11660.248	190369	e	1.5	198943	o	2.5	-4.95	4.97 × 10 ⁰²	0.001
11716.824	179001	e	2.5	187533	o	3.5	-4.63	1.26 × 10 ⁰³	0.000
11827.861	188273	e	0.5	196725	o	1.5	-4.33	2.35 × 10 ⁰³	0.001
11926.920	188273	e	0.5	196655	o	0.5	-4.40	1.89 × 10 ⁰³	0.001
12135.989	187547	e	1.5	195785	o	1.5	-5.11	3.35 × 10 ⁰²	0.000
12159.903	182571	e	1.5	190793	o	1.5	-4.14	2.23 × 10 ⁰³	0.001
12200.713	193861	o	0.5	202055	e	0.5	-5.35	1.97 × 10 ⁰²	0.000
12254.553	177951	e	0.5	186109	o	0.5	-5.19	2.29 × 10 ⁰²	0.000
12798.301	182219	o	3.5	190031	e	2.5	-4.68	8.07 × 10 ⁰²	0.000
13308.394	188273	e	0.5	195785	o	1.5	-3.27	2.09 × 10 ⁰⁴	0.005
13518.222	180152	o	2.5	187547	e	1.5	-3.96	4.24 × 10 ⁰³	0.003
13715.364	202055	e	0.5	209344	o	0.5	-3.08	2.85 × 10 ⁰⁴	0.015
14426.695	173222	e	1.5	180152	o	2.5	-3.38	1.60 × 10 ⁰⁴	0.023
14933.777	190031	e	2.5	196725	o	1.5	-4.94	3.48 × 10 ⁰²	0.000
15438.365	190031	e	2.5	196506	o	2.5	-3.63	7.10 × 10 ⁰³	0.004
15729.857	190369	e	1.5	196725	o	1.5	-3.01	2.24 × 10 ⁰⁴	0.019
15834.247	187547	e	1.5	193861	o	0.5	-4.50	8.32 × 10 ⁰²	0.000
15882.041	190031	e	2.5	196325	o	3.5	-3.78	4.98 × 10 ⁰³	0.001
15905.540	190369	e	1.5	196655	o	0.5	-3.86	2.95 × 10 ⁰³	0.021
15944.607	195785	o	1.5	202055	e	0.5	-4.81	4.13 × 10 ⁰²	0.001
16184.143	176042	e	2.5	182219	o	3.5	-3.61	7.27 × 10 ⁰³	0.001
16256.779	182571	e	1.5	188721	o	2.5	-3.41	4.91 × 10 ⁰³	0.004
16290.687	190369	e	1.5	196506	o	2.5	-4.52	6.83 × 10 ⁰²	0.001
16860.223	186049	e	2.5	191978	o	2.5	-4.16	1.93 × 10 ⁰³	0.005
16952.857	180152	o	2.5	186049	e	2.5	-4.54	6.02 × 10 ⁰²	0.007
17208.188	186049	e	2.5	191858	o	1.5	-4.78	4.57 × 10 ⁰²	0.001
17374.167	190031	e	2.5	195785	o	1.5	-3.57	5.90 × 10 ⁰³	0.003
17890.604	188273	e	0.5	193861	o	0.5	-3.33	1.07 × 10 ⁰⁴	0.022
18461.156	190369	e	1.5	195785	o	1.5	-3.11	1.21 × 10 ⁰⁴	0.015
18513.806	196655	o	0.5	202055	e	0.5	-4.99	2.06 × 10 ⁰²	0.003
18757.660	196725	o	1.5	202055	e	0.5	-4.52	5.61 × 10 ⁰²	0.001
21079.704	186049	e	2.5	190793	o	1.5	-5.94	2.13 × 10 ⁰¹	0.000
22567.252	187547	e	1.5	191978	o	2.5	-3.46	4.46 × 10 ⁰³	0.007
23194.861	187547	e	1.5	191858	o	1.5	-3.60	3.21 × 10 ⁰³	0.008
23278.552	177923	e	3.5	182219	o	3.5	-4.11	1.13 × 10 ⁰³	0.003
23473.077	186109	o	0.5	190369	e	1.5	-3.51	4.72 × 10 ⁰³	0.007
24333.270	176042	e	2.5	180152	o	2.5	-5.49	4.10 × 10 ⁰¹	0.000
24818.208	176122	e	1.5	180152	o	2.5	-4.25	6.10 × 10 ⁰²	0.002
24958.819	202055	e	0.5	206061	o	1.5	-3.38	4.27 × 10 ⁰³	0.028
26113.070	182219	o	3.5	186049	e	2.5	-5.59	1.76 × 10 ⁰¹	0.001
26360.882	186049	e	2.5	189842	o	3.5	-5.01	1.17 × 10 ⁰²	0.002
27889.336	188273	e	0.5	191858	o	1.5	-4.20	6.57 × 10 ⁰²	0.003
28263.758	182571	e	1.5	186109	o	0.5	-3.54	7.30 × 10 ⁰²	0.010
28642.627	190369	e	1.5	193861	o	0.5	-4.40	2.43 × 10 ⁰²	0.014
30810.945	187547	e	1.5	190793	o	1.5	-5.46	2.49 × 10 ⁰¹	0.000
31069.410	179001	e	2.5	182219	o	3.5	-4.35	4.92 × 10 ⁰²	0.001
37425.151	186049	e	2.5	188721	o	2.5	-3.85	7.66 × 10 ⁰²	0.016
37627.936	199397	o	1.5	202055	e	0.5	-4.62	1.14 × 10 ⁰²	0.002
39684.116	188273	e	0.5	190793	o	1.5	-4.55	1.55 × 10 ⁰²	0.001

Table B.5. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
40038.438	187533	o	3.5	190031	e	2.5	-5.41	1.91×10^{01}	0.000
41330.854	180152	o	2.5	182571	e	1.5	-4.52	3.39×10^{02}	0.001
44879.276	177923	e	3.5	180152	o	2.5	-3.97	3.73×10^{02}	0.015
46221.402	186109	o	0.5	188273	e	0.5	-5.68	5.46×10^{00}	0.000
47952.433	202055	e	0.5	204140	o	1.5	-4.50	7.18×10^{01}	0.002
51345.248	190031	e	2.5	191978	o	2.5	-4.22	1.72×10^{02}	0.003
54713.577	190031	e	2.5	191858	o	1.5	-4.75	4.88×10^{01}	0.001
60653.851	188721	o	2.5	190369	e	1.5	-4.45	1.40×10^{02}	0.002
62158.133	190369	e	1.5	191978	o	2.5	-5.22	5.59×10^{00}	0.001
67163.680	190369	e	1.5	191858	o	1.5	-5.37	3.76×10^{00}	0.001
67371.828	186049	e	2.5	187533	o	3.5	-5.69	3.83×10^{00}	0.002
69550.705	186109	o	0.5	187547	e	1.5	-4.10	1.32×10^{02}	0.002
76341.708	188721	o	2.5	190031	e	2.5	-3.82	2.41×10^{02}	0.006
85200.650	187547	e	1.5	188721	o	2.5	-3.74	8.11×10^{01}	0.012
86565.100	200899	o	0.5	202055	e	0.5	-4.81	1.43×10^{01}	0.005
86880.976	179001	e	2.5	180152	o	2.5	-7.82	3.01×10^{02}	0.000
97370.987	201028	o	1.5	202055	e	0.5	-5.82	1.61×10^{00}	0.000
131233.600	190031	e	2.5	190793	o	1.5	-5.98	5.82×10^{01}	0.000

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from Saloman (2004).

Table B.6. Calculated HFR oscillator strengths (log *gf*) and transition probabilities (*gA*) in Xe v. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
318.590	0	e	0.0	313883	o	1.0	-2.56	1.82×10^{08}	0.036
326.728	0	e	0.0	306065	o	1.0	-3.87	8.40×10^{06}	0.001
328.309	9292	e	1.0	313883	o	1.0	-1.88	8.24×10^{08}	0.557
329.311	9292	e	1.0	312956	o	2.0	-1.10	4.88×10^{09}	0.644
331.614	0	e	0.0	301555	o	1.0	-2.78	1.02×10^{08}	0.007
333.604	14127	e	2.0	313883	o	1.0	-1.61	1.46×10^{09}	0.100
334.639	14127	e	2.0	312956	o	2.0	-0.81	9.18×10^{09}	0.634
335.511	0	e	0.0	298053	o	1.0	-1.23	3.48×10^{09}	0.482
336.958	9292	e	1.0	306065	o	1.0	-2.61	1.44×10^{08}	0.055
341.640	9292	e	1.0	301998	o	0.0	-2.25	3.24×10^{08}	0.065
342.157	9292	e	1.0	301555	o	1.0	-1.58	1.50×10^{09}	0.149
342.538	14127	e	2.0	306065	o	1.0	-4.46	1.96×10^{06}	0.000
344.466	9292	e	1.0	299596	o	2.0	-1.50	1.79×10^{09}	0.222
346.224	0	e	0.0	288830	o	1.0	-1.47	1.89×10^{09}	0.170
346.307	9292	e	1.0	298053	o	1.0	-1.41	2.17×10^{09}	0.617
347.913	14127	e	2.0	301555	o	1.0	-2.42	2.10×10^{08}	0.038
349.406	14127	e	2.0	300327	o	3.0	-0.97	5.83×10^{09}	0.272
350.297	28411	e	2.0	313883	o	1.0	-0.64	1.24×10^{10}	0.670
350.300	14127	e	2.0	299596	o	2.0	-2.01	5.25×10^{08}	0.035
351.439	28411	e	2.0	312956	o	2.0	-1.16	3.77×10^{09}	0.619
352.204	14127	e	2.0	298053	o	1.0	-0.85	7.66×10^{09}	0.667
357.733	9292	e	1.0	288830	o	1.0	-2.36	2.26×10^{08}	0.038
359.584	9292	e	1.0	287391	o	2.0	-1.35	2.29×10^{09}	0.176
360.161	28411	e	2.0	306065	o	1.0	-4.13	3.79×10^{06}	0.000
364.029	14127	e	2.0	288830	o	1.0	-3.58	1.34×10^{07}	0.004
365.538	14127	e	2.0	287696	o	3.0	-1.33	2.34×10^{09}	0.230

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
365.946	14127	e	2.0	287391	o	2.0	-1.95	5.54 × 10 ⁰⁸	0.035
366.108	28411	e	2.0	301555	o	1.0	-1.98	5.20 × 10 ⁰⁸	0.164
367.761	28411	e	2.0	300327	o	3.0	-2.05	4.36 × 10 ⁰⁸	0.033
368.752	28411	e	2.0	299596	o	2.0	-1.88	6.49 × 10 ⁰⁸	0.042
370.862	28411	e	2.0	298053	o	1.0	-1.89	6.25 × 10 ⁰⁸	0.058
371.178	44470	e	0.0	313883	o	1.0	-1.17	3.29 × 10 ⁰⁹	0.525
382.271	44470	e	0.0	306065	o	1.0	-1.34	2.11 × 10 ⁰⁹	0.128
383.997	28411	e	2.0	288830	o	1.0	-3.45	1.60 × 10 ⁰⁷	0.004
385.676	28411	e	2.0	287696	o	3.0	-2.76	7.76 × 10 ⁰⁷	0.009
386.131	28411	e	2.0	287391	o	2.0	-2.92	5.38 × 10 ⁰⁷	0.005
388.977	44470	e	0.0	301555	o	1.0	-4.87	6.01 × 10 ⁰⁵	0.000
394.349	44470	e	0.0	298053	o	1.0	-2.43	1.58 × 10 ⁰⁸	0.045
409.233	44470	e	0.0	288830	o	1.0	-2.88	5.27 × 10 ⁰⁷	0.011
469.395	0	e	0.0	213040	o	1.0	-4.78	5.05 × 10 ⁰⁵	0.000
490.801	9292	e	1.0	213040	o	1.0	-1.43	1.03 × 10 ⁰⁹	0.282
500.103	0	e	0.0	199959	o	1.0	-1.01	2.61 × 10 ⁰⁹	0.042
500.558	9292	e	1.0	209069	o	2.0	-0.35	1.20 × 10 ¹⁰	0.683
502.731	14127	e	2.0	213040	o	1.0	-0.70	5.30 × 10 ⁰⁹	0.125
512.973	14127	e	2.0	209069	o	2.0	-0.07	2.17 × 10 ¹⁰	0.663
514.846	0	e	0.0	194233	o	1.0	-0.54	7.29 × 10 ⁰⁹	0.197
524.474	9292	e	1.0	199959	o	1.0	-0.88	3.22 × 10 ⁰⁹	0.178
538.120	14127	e	2.0	199959	o	1.0	-1.53	6.71 × 10 ⁰⁸	0.016
540.713	9292	e	1.0	194233	o	1.0	-1.29	1.18 × 10 ⁰⁹	0.091
541.297	9292	e	1.0	194033	o	0.0	-0.59	5.84 × 10 ⁰⁹	0.453
541.627	28411	e	2.0	213040	o	1.0	0.08	2.71 × 10 ¹⁰	0.497
543.043	0	e	0.0	184148	o	1.0	-2.20	1.44 × 10 ⁰⁸	0.002
553.533	28411	e	2.0	209069	o	2.0	-0.44	7.90 × 10 ⁰⁹	0.619
555.228	14127	e	2.0	194233	o	1.0	-0.23	1.27 × 10 ¹⁰	0.316
555.521	14127	e	2.0	194138	o	3.0	-0.08	1.81 × 10 ¹⁰	0.107
566.562	9292	e	1.0	185795	o	2.0	-0.89	2.68 × 10 ⁰⁹	0.024
571.900	9292	e	1.0	184148	o	1.0	0.14	2.83 × 10 ¹⁰	0.443
575.595	9292	e	1.0	183025	o	0.0	-0.07	1.71 × 10 ¹⁰	0.604
577.795	0	e	0.0	173072	o	1.0	0.17	2.96 × 10 ¹⁰	0.347
582.369	9292	e	1.0	181004	o	2.0	0.29	3.85 × 10 ¹⁰	0.628
582.519	14127	e	2.0	185795	o	2.0	-0.11	1.53 × 10 ¹⁰	0.097
582.928	28411	e	2.0	199959	o	1.0	-0.85	2.75 × 10 ⁰⁹	0.066
588.163	14127	e	2.0	184148	o	1.0	-0.09	1.56 × 10 ¹⁰	0.393
589.370	0	e	0.0	169673	o	1.0	0.07	2.25 × 10 ¹⁰	0.317
593.226	44470	e	0.0	213040	o	1.0	0.02	2.00 × 10 ¹⁰	0.733
595.095	14127	e	2.0	182167	o	3.0	0.83	1.26 × 10 ¹¹	0.665
599.242	14127	e	2.0	181004	o	2.0	0.41	4.74 × 10 ¹⁰	0.575
603.057	28411	e	2.0	194233	o	1.0	-0.68	3.80 × 10 ⁰⁹	0.094
603.403	28411	e	2.0	194138	o	3.0	0.86	1.32 × 10 ¹¹	0.669
610.576	9292	e	1.0	173072	o	1.0	-0.02	1.71 × 10 ¹⁰	0.273
618.445	9292	e	1.0	170988	o	2.0	0.47	5.11 × 10 ¹⁰	0.638
623.516	9292	e	1.0	169673	o	1.0	-1.50	5.45 × 10 ⁰⁸	0.013
629.148	14127	e	2.0	173072	o	1.0	-1.98	1.75 × 10 ⁰⁸	0.004
631.415	92183	o	2.0	250557	e	2.0	-2.97	1.82 × 10 ⁰⁷	0.021
635.389	28411	e	2.0	185795	o	2.0	0.57	6.11 × 10 ¹⁰	0.581
637.507	14127	e	2.0	170988	o	2.0	0.07	1.92 × 10 ¹⁰	0.166
642.111	28411	e	2.0	184148	o	1.0	-0.28	8.49 × 10 ⁰⁹	0.443
642.560	92183	o	2.0	247810	e	1.0	-1.67	3.44 × 10 ⁰⁸	0.151
642.897	14127	e	2.0	169673	o	1.0	-1.53	4.81 × 10 ⁰⁸	0.008
643.012	0	e	0.0	155518	o	1.0	-0.46	5.60 × 10 ⁰⁹	0.197
643.134	44470	e	0.0	199959	o	1.0	0.25	2.89 × 10 ¹⁰	0.487

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
649.244	92183	o	2.0	246208	e	3.0	-4.57	4.21 × 10 ⁰⁵	0.001
650.381	28411	e	2.0	182167	o	3.0	-0.15	1.11 × 10 ¹⁰	0.114
655.143	92183	o	2.0	244821	e	2.0	-4.21	9.54 × 10 ⁰⁵	0.001
655.338	28411	e	2.0	181004	o	2.0	-0.14	1.13 × 10 ¹⁰	0.138
662.104	92183	o	2.0	243217	e	1.0	-2.32	7.33 × 10 ⁰⁷	0.054
667.724	44470	e	0.0	194233	o	1.0	-0.51	4.63 × 10 ⁰⁹	0.175
679.279	9292	e	1.0	156507	o	2.0	-0.95	1.63 × 10 ⁰⁹	0.578
682.577	14127	e	2.0	160630	o	3.0	-0.27	7.70 × 10 ⁰⁹	0.647
683.872	9292	e	1.0	155518	o	1.0	-0.16	9.86 × 10 ⁰⁹	0.299
691.274	28411	e	2.0	173072	o	1.0	-0.20	8.76 × 10 ⁰⁹	0.297
692.732	115286	o	1.0	259642	e	0.0	-2.20	8.81 × 10 ⁰⁷	0.060
699.320	92183	o	2.0	235179	e	2.0	-3.05	1.20 × 10 ⁰⁷	0.020
701.378	28411	e	2.0	170988	o	2.0	-0.46	4.75 × 10 ⁰⁹	0.062
702.345	14127	e	2.0	156507	o	2.0	-0.87	1.80 × 10 ⁰⁹	0.233
702.875	92183	o	2.0	234456	e	1.0	-2.45	4.73 × 10 ⁰⁷	0.074
707.257	14127	e	2.0	155518	o	1.0	0.22	2.21 × 10 ¹⁰	0.405
707.907	28411	e	2.0	169673	o	1.0	-0.19	8.58 × 10 ⁰⁹	0.183
715.936	44470	e	0.0	184148	o	1.0	-3.91	1.59 × 10 ⁰⁶	0.000
732.519	9292	e	1.0	145807	o	2.0	-1.61	3.07 × 10 ⁰⁸	0.029
735.932	92183	o	2.0	228065	e	1.0	-3.77	2.11 × 10 ⁰⁶	0.046
739.257	115286	o	1.0	250557	e	2.0	-3.23	7.22 × 10 ⁰⁶	0.002
743.079	0	e	0.0	134575	o	1.0	-1.06	1.06 × 10 ⁰⁹	0.044
743.714	116097	o	2.0	250557	e	2.0	-1.78	2.02 × 10 ⁰⁸	0.034
754.580	115286	o	1.0	247810	e	1.0	-2.75	2.09 × 10 ⁰⁷	0.004
756.320	28411	e	2.0	160630	o	3.0	-2.87	1.57 × 10 ⁰⁷	0.002
759.224	116097	o	2.0	247810	e	1.0	-1.32	5.60 × 10 ⁰⁸	0.061
759.415	14127	e	2.0	145807	o	2.0	-2.26	6.31 × 10 ⁰⁷	0.001
765.473	119919	o	3.0	250557	e	2.0	-1.37	4.95 × 10 ⁰⁸	0.117
768.575	116097	o	2.0	246208	e	3.0	-2.76	1.95 × 10 ⁰⁷	0.008
771.992	115286	o	1.0	244821	e	2.0	-3.04	1.01 × 10 ⁰⁷	0.003
776.854	116097	o	2.0	244821	e	2.0	-1.60	2.80 × 10 ⁰⁸	0.038
777.597	44470	e	0.0	173072	o	1.0	-1.47	3.76 × 10 ⁰⁸	0.024
780.667	28411	e	2.0	156507	o	2.0	-0.92	1.31 × 10 ⁰⁹	0.169
781.676	115286	o	1.0	243217	e	1.0	-1.42	4.17 × 10 ⁰⁸	0.043
786.661	116097	o	2.0	243217	e	1.0	-1.01	1.05 × 10 ⁰⁹	0.063
786.739	28411	e	2.0	155518	o	1.0	-1.83	1.58 × 10 ⁰⁸	0.005
791.835	119919	o	3.0	246208	e	3.0	-1.37	4.56 × 10 ⁰⁸	0.093
792.335	186747	e	3.0	312956	o	2.0	-5.82	1.61 × 10 ⁰⁴	0.002
797.379	9292	e	1.0	134703	o	2.0	-2.51	3.25 × 10 ⁰⁷	0.001
798.190	9292	e	1.0	134575	o	1.0	-0.64	2.41 × 10 ⁰⁹	0.123
798.708	44470	e	0.0	169673	o	1.0	-1.00	1.05 × 10 ⁰⁹	0.032
799.571	134575	o	1.0	259642	e	0.0	-4.36	4.51 × 10 ⁰⁵	0.001
800.626	119919	o	3.0	244821	e	2.0	-0.96	1.14 × 10 ⁰⁹	0.159
802.808	92183	o	2.0	216746	e	2.0	-3.94	1.18 × 10 ⁰⁶	0.014
805.696	9292	e	1.0	133408	o	0.0	-1.04	9.42 × 10 ⁰⁸	0.109
811.081	189664	e	3.0	312956	o	2.0	-4.39	4.09 × 10 ⁰⁵	0.009
817.799	191604	e	2.0	313883	o	1.0	-4.39	4.09 × 10 ⁰⁵	0.003
824.046	191604	e	2.0	312956	o	2.0	-6.23	5.78 × 10 ⁰³	0.001
829.352	14127	e	2.0	134703	o	2.0	-0.43	3.59 × 10 ⁰⁹	0.072
830.230	14127	e	2.0	134575	o	1.0	-2.05	8.70 × 10 ⁰⁷	0.007
834.080	115286	o	1.0	235179	e	2.0	-2.82	1.45 × 10 ⁰⁷	0.007
839.142	115286	o	1.0	234456	e	1.0	-2.22	5.70 × 10 ⁰⁷	0.011
839.758	116097	o	2.0	235179	e	2.0	-2.17	6.34 × 10 ⁰⁷	0.010
842.368	115286	o	1.0	233999	e	0.0	-1.31	4.59 × 10 ⁰⁸	0.114
844.890	116097	o	2.0	234456	e	1.0	-1.02	8.84 × 10 ⁰⁸	0.109

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
851.819	28411	e	2.0	145807	o	2.0	-0.56	2.51×10^{09}	0.051
853.768	92183	o	2.0	209311	e	1.0	-4.20	5.81×10^{05}	0.041
862.203	134575	o	1.0	250557	e	2.0	-2.87	1.24×10^{07}	0.007
863.152	134703	o	2.0	250557	e	2.0	-1.27	4.93×10^{08}	0.027
867.406	0	e	0.0	115286	o	1.0	-0.84	1.30×10^{09}	0.070
867.604	119919	o	3.0	235179	e	2.0	-0.91	1.09×10^{09}	0.223
868.177	92183	o	2.0	207367	e	2.0	-2.95	1.00×10^{07}	0.070
873.656	191604	e	2.0	306065	o	1.0	-2.17	5.86×10^{07}	0.039
874.108	133408	o	0.0	247810	e	1.0	-2.15	6.22×10^{07}	0.025
880.434	186747	e	3.0	300327	o	3.0	-3.13	6.47×10^{06}	0.004
880.468	92183	o	2.0	205759	e	3.0	-1.99	8.82×10^{07}	0.185
883.118	134575	o	1.0	247810	e	1.0	-1.49	2.78×10^{08}	0.054
884.113	134703	o	2.0	247810	e	1.0	-1.64	1.98×10^{08}	0.026
885.380	200010	e	3.0	312956	o	2.0	-5.37	3.61×10^{04}	0.006
886.138	186747	e	3.0	299596	o	2.0	-2.48	2.79×10^{07}	0.007
886.693	115286	o	1.0	228065	e	1.0	-1.68	1.78×10^{08}	0.130
892.919	186747	e	3.0	298739	o	4.0	-4.34	3.79×10^{05}	0.001
893.113	116097	o	2.0	228065	e	1.0	-3.48	2.80×10^{06}	0.004
896.818	134703	o	2.0	246208	e	3.0	-2.35	3.70×10^{07}	0.020
900.514	44470	e	0.0	155518	o	1.0	-1.64	1.88×10^{08}	0.021
903.643	189664	e	3.0	300327	o	3.0	-4.12	6.15×10^{05}	0.000
907.062	134575	o	1.0	244821	e	2.0	-1.76	1.40×10^{08}	0.066
908.112	134703	o	2.0	244821	e	2.0	-1.22	4.84×10^{08}	0.045
909.492	191604	e	2.0	301555	o	1.0	-2.23	4.79×10^{07}	0.021
909.652	189664	e	3.0	299596	o	2.0	-4.12	6.12×10^{05}	0.000
910.677	133408	o	0.0	243217	e	1.0	-2.03	7.50×10^{07}	0.023
911.724	190645	e	4.0	300327	o	3.0	-2.18	5.35×10^{07}	0.009
916.799	189664	e	3.0	298739	o	4.0	-2.74	1.44×10^{07}	0.005
919.764	191604	e	2.0	300327	o	3.0	-3.32	3.84×10^{06}	0.002
920.460	134575	o	1.0	243217	e	1.0	-1.63	1.84×10^{08}	0.032
921.542	134703	o	2.0	243217	e	1.0	-1.42	3.02×10^{08}	0.026
925.118	190645	e	4.0	298739	o	4.0	-3.16	5.38×10^{06}	0.002
925.990	191604	e	2.0	299596	o	2.0	-1.99	7.92×10^{07}	0.033
927.408	92183	o	2.0	200010	e	3.0	-2.95	8.69×10^{06}	0.149
932.860	205759	e	3.0	312956	o	2.0	-3.92	9.21×10^{05}	0.011
936.284	9292	e	1.0	116097	o	2.0	-0.68	1.59×10^{09}	0.059
938.823	207367	e	2.0	313883	o	1.0	-3.68	1.57×10^{06}	0.015
939.413	191604	e	2.0	298053	o	1.0	-4.06	6.68×10^{05}	0.006
940.809	28411	e	2.0	134703	o	2.0	-1.60	1.89×10^{08}	0.006
941.939	28411	e	2.0	134575	o	1.0	-3.66	1.66×10^{06}	0.000
943.445	9292	e	1.0	115286	o	1.0	-2.70	1.51×10^{07}	0.001
945.248	14127	e	2.0	119919	o	3.0	-0.78	1.25×10^{09}	0.047
947.066	207367	e	2.0	312956	o	2.0	-5.71	1.46×10^{04}	0.001
954.652	145807	o	2.0	250557	e	2.0	-0.46	2.57×10^{09}	0.143
956.276	209311	e	1.0	313883	o	1.0	-4.84	1.06×10^{05}	0.007
960.392	155518	o	1.0	259642	e	0.0	-2.21	4.45×10^{07}	0.049
980.359	145807	o	2.0	247810	e	1.0	-1.15	4.98×10^{08}	0.132
980.678	14127	e	2.0	116097	o	2.0	-2.56	1.93×10^{07}	0.001
985.617	115286	o	1.0	216746	e	2.0	-2.05	6.08×10^{07}	0.042
988.537	14127	e	2.0	115286	o	1.0	-1.85	9.58×10^{07}	0.029
989.634	133408	o	0.0	234456	e	1.0	-3.08	5.60×10^{06}	0.003
990.596	186747	e	3.0	287696	o	3.0	-1.89	8.84×10^{07}	0.006
993.556	116097	o	2.0	216746	e	2.0	-3.83	1.01×10^{06}	0.001
993.598	186747	e	3.0	287391	o	2.0	-2.51	2.09×10^{07}	0.018
993.999	134575	o	1.0	235179	e	2.0	-3.82	1.03×10^{06}	0.001

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
995.261	134703	o	2.0	235179	e	2.0	-1.70	1.35×10^{08}	0.021
996.006	145807	o	2.0	246208	e	3.0	-2.60	1.68×10^{07}	0.023
996.842	200010	e	3.0	300327	o	3.0	-1.79	1.10×10^{08}	0.052
1001.197	134575	o	1.0	234456	e	1.0	-3.71	1.31×10^{06}	0.000
1002.477	134703	o	2.0	234456	e	1.0	-1.38	2.80×10^{08}	0.039
1004.159	200010	e	3.0	299596	o	2.0	-0.98	6.93×10^{08}	0.203
1005.792	134575	o	1.0	233999	e	0.0	-2.71	1.29×10^{07}	0.006
1005.827	92183	o	2.0	191604	e	2.0	-3.06	5.67×10^{06}	0.198
1009.955	145807	o	2.0	244821	e	2.0	-1.88	8.71×10^{07}	0.011
1012.332	201545	e	4.0	300327	o	3.0	-0.84	9.38×10^{08}	0.215
1012.876	200010	e	3.0	298739	o	4.0	-2.33	3.08×10^{07}	0.039
1013.189	207367	e	2.0	306065	o	1.0	-3.71	1.26×10^{06}	0.001
1020.073	189664	e	3.0	287696	o	3.0	-2.23	3.82×10^{07}	0.004
1023.257	189664	e	3.0	287391	o	2.0	-1.05	5.68×10^{08}	0.136
1025.841	92183	o	2.0	189664	e	3.0	-2.00	6.42×10^{07}	0.423
1026.594	145807	o	2.0	243217	e	1.0	-1.69	1.29×10^{08}	0.016
1028.526	191604	e	2.0	288830	o	1.0	-1.22	3.76×10^{08}	0.116
1028.872	201545	e	4.0	298739	o	4.0	-1.54	1.82×10^{08}	0.081
1029.470	216746	e	2.0	313883	o	1.0	-1.93	7.34×10^{07}	0.104
1030.383	190645	e	4.0	287696	o	3.0	-0.91	7.76×10^{08}	0.134
1032.774	119919	o	3.0	216746	e	2.0	-3.34	2.89×10^{06}	0.017
1033.546	209311	e	1.0	306065	o	1.0	-4.59	1.61×10^{05}	0.001
1036.729	202282	e	5.0	298739	o	4.0	-0.69	1.27×10^{09}	0.233
1039.389	216746	e	2.0	312956	o	2.0	-4.09	5.01×10^{05}	0.020
1040.664	191604	e	2.0	287696	o	3.0	-1.24	3.58×10^{08}	0.027
1043.978	191604	e	2.0	287391	o	2.0	-2.30	3.08×10^{07}	0.020
1052.199	155518	o	1.0	250557	e	2.0	-3.31	3.05×10^{06}	0.001
1056.448	133408	o	0.0	228065	e	1.0	-6.80	9.56×10^{02}	0.000
1057.438	205759	e	3.0	300327	o	3.0	-1.56	1.65×10^{08}	0.066
1057.486	92183	o	2.0	186747	e	3.0	-3.31	2.91×10^{06}	0.165
1059.337	119919	o	3.0	214318	e	4.0	-1.90	7.54×10^{07}	0.161
1061.703	207367	e	2.0	301555	o	1.0	-1.32	2.84×10^{08}	0.157
1063.260	156507	o	2.0	250557	e	2.0	-1.56	1.67×10^{08}	0.079
1063.554	115286	o	1.0	209311	e	1.0	-2.20	3.72×10^{07}	0.033
1065.675	205759	e	3.0	299596	o	2.0	-2.00	5.88×10^{07}	0.040
1069.637	134575	o	1.0	228065	e	1.0	-6.76	1.03×10^{03}	0.000
1071.097	134703	o	2.0	228065	e	1.0	-0.94	6.72×10^{08}	0.295
1072.804	116097	o	2.0	209311	e	1.0	-2.38	2.39×10^{07}	0.081
1075.498	205759	e	3.0	298739	o	4.0	-4.03	5.33×10^{05}	0.000
1075.728	207367	e	2.0	300327	o	3.0	-2.22	3.46×10^{07}	0.015
1078.896	209311	e	1.0	301998	o	0.0	-1.55	1.62×10^{08}	0.564
1083.514	155518	o	1.0	247810	e	1.0	-3.25	3.21×10^{06}	0.002
1084.078	209311	e	1.0	301555	o	1.0	-1.45	2.04×10^{08}	0.214
1084.254	207367	e	2.0	299596	o	2.0	-2.89	7.36×10^{06}	0.004
1086.007	115286	o	1.0	207367	e	2.0	-2.90	7.06×10^{06}	0.003
1092.803	28411	e	2.0	119919	o	3.0	-1.02	5.38×10^{08}	0.061
1095.247	156507	o	2.0	247810	e	1.0	-1.83	8.36×10^{07}	0.198
1095.654	116097	o	2.0	207367	e	2.0	-1.60	1.39×10^{08}	0.065
1102.702	207367	e	2.0	298053	o	1.0	-2.56	1.52×10^{07}	0.156
1107.600	209311	e	1.0	299596	o	2.0	-3.31	2.64×10^{06}	0.003
1109.819	44470	e	0.0	134575	o	1.0	-1.92	6.48×10^{07}	0.064
1111.485	169673	o	1.0	259642	e	0.0	-1.75	9.46×10^{07}	0.033
1112.016	160630	o	3.0	250557	e	2.0	-2.36	2.42×10^{07}	0.008
1114.812	156507	o	2.0	246208	e	3.0	-2.83	7.98×10^{06}	0.039
1115.302	116097	o	2.0	205759	e	3.0	-3.95	6.00×10^{05}	0.000

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1118.920	145807	o	2.0	235179	e	2.0	-1.58	1.42×10^{08}	0.033
1119.578	216746	e	2.0	306065	o	1.0	-1.10	4.24×10^{08}	0.179
1119.781	155518	o	1.0	244821	e	2.0	-2.45	1.87×10^{07}	0.015
1126.858	209311	e	1.0	298053	o	1.0	-2.95	5.96×10^{06}	0.203
1128.049	145807	o	2.0	234456	e	1.0	-2.42	2.02×10^{07}	0.004
1132.317	156507	o	2.0	244821	e	2.0	-2.00	5.22×10^{07}	0.023
1140.272	155518	o	1.0	243217	e	1.0	-2.00	5.18×10^{07}	0.018
1140.436	28411	e	2.0	116097	o	2.0	-2.39	2.10×10^{07}	0.004
1140.436	200010	e	3.0	287696	o	3.0	-1.78	8.63×10^{07}	0.009
1143.541	119919	o	3.0	207367	e	2.0	-2.02	4.85×10^{07}	0.185
1144.416	200010	e	3.0	287391	o	2.0	-3.05	4.57×10^{06}	0.002
1151.078	28411	e	2.0	115286	o	1.0	-1.83	7.44×10^{07}	0.046
1153.274	156507	o	2.0	243217	e	1.0	-1.08	4.23×10^{08}	0.142
1155.127	173072	o	1.0	259642	e	0.0	-1.81	7.77×10^{07}	0.087
1160.755	201545	e	4.0	287696	o	3.0	-2.46	1.74×10^{07}	0.005
1162.665	214318	e	4.0	300327	o	3.0	-2.14	3.59×10^{07}	0.045
1164.961	119919	o	3.0	205759	e	3.0	-1.00	4.94×10^{08}	0.247
1165.255	228065	e	1.0	313883	o	1.0	-1.93	5.80×10^{07}	0.013
1168.530	160630	o	3.0	246208	e	3.0	-1.04	4.38×10^{08}	0.141
1177.980	228065	e	1.0	312956	o	2.0	-3.28	2.50×10^{06}	0.005
1179.115	216746	e	2.0	301555	o	1.0	-2.97	5.23×10^{06}	0.014
1184.535	214318	e	4.0	298739	o	4.0	-3.60	1.20×10^{06}	0.004
1187.777	160630	o	3.0	244821	e	2.0	-0.93	5.53×10^{08}	0.081
1191.708	116097	o	2.0	200010	e	3.0	-1.10	3.71×10^{08}	0.213
1196.438	216746	e	2.0	300327	o	3.0	-2.27	2.54×10^{07}	0.026
1206.404	9292	e	1.0	92183	o	2.0	-1.88	6.05×10^{07}	0.155
1206.995	216746	e	2.0	299596	o	2.0	-2.75	8.14×10^{06}	0.006
1215.689	145807	o	2.0	228065	e	1.0	-0.66	1.01×10^{09}	0.314
1216.983	134575	o	1.0	216746	e	2.0	-2.34	2.06×10^{07}	0.049
1218.875	134703	o	2.0	216746	e	2.0	-2.08	3.77×10^{07}	0.014
1220.447	205759	e	3.0	287696	o	3.0	-2.88	5.95×10^{06}	0.003
1225.007	205759	e	3.0	287391	o	2.0	-1.97	4.71×10^{07}	0.021
1225.097	119919	o	3.0	201545	e	4.0	-0.63	1.06×10^{09}	0.318
1227.547	207367	e	2.0	288830	o	1.0	-2.27	2.35×10^{07}	0.016
1229.900	216746	e	2.0	298053	o	1.0	-2.34	2.02×10^{07}	0.097
1236.329	169673	o	1.0	250557	e	2.0	-1.86	6.13×10^{07}	0.014
1244.876	207367	e	2.0	287696	o	3.0	-3.91	5.30×10^{05}	0.000
1248.577	119919	o	3.0	200010	e	3.0	-2.35	1.91×10^{07}	0.056
1249.620	207367	e	2.0	287391	o	2.0	-3.16	2.96×10^{06}	0.002
1251.820	233999	e	0.0	313883	o	1.0	-1.76	7.49×10^{07}	0.059
1255.323	155518	o	1.0	235179	e	2.0	-2.33	1.97×10^{07}	0.022
1256.761	170988	o	2.0	250557	e	2.0	-2.89	5.60×10^{06}	0.001
1257.556	209311	e	1.0	288830	o	1.0	-3.23	2.45×10^{06}	0.003
1259.011	234456	e	1.0	313883	o	1.0	-1.48	1.41×10^{08}	0.038
1266.825	155518	o	1.0	234456	e	1.0	-2.74	7.64×10^{06}	0.008
1270.582	235179	e	2.0	313883	o	1.0	-1.13	3.08×10^{08}	0.064
1271.099	156507	o	2.0	235179	e	2.0	-1.01	4.09×10^{08}	0.182
1273.879	234456	e	1.0	312956	o	2.0	-3.17	2.80×10^{06}	0.001
1274.191	155518	o	1.0	233999	e	0.0	-2.48	1.34×10^{07}	0.027
1279.790	169673	o	1.0	247810	e	1.0	-2.52	1.22×10^{07}	0.006
1280.733	209311	e	1.0	287391	o	2.0	-3.68	8.57×10^{05}	0.002
1281.130	14127	e	2.0	92183	o	2.0	-1.84	5.93×10^{07}	0.121
1282.050	228065	e	1.0	306065	o	1.0	-1.29	2.08×10^{08}	0.033
1282.893	156507	o	2.0	234456	e	1.0	-0.60	1.02×10^{09}	0.431
1285.725	235179	e	2.0	312956	o	2.0	-1.47	1.37×10^{08}	0.033

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1290.564	173072	o	1.0	250557	e	2.0	-2.45	1.46×10^{07}	0.008
1301.697	170988	o	2.0	247810	e	1.0	-1.90	5.03×10^{07}	0.012
1308.753	169799	o	4.0	246208	e	3.0	0.32	8.00×10^{09}	0.572
1310.321	115286	o	1.0	191604	e	2.0	-0.68	8.08×10^{08}	0.378
1317.478	133408	o	0.0	209311	e	1.0	-1.22	2.29×10^{08}	0.411
1324.389	116097	o	2.0	191604	e	2.0	-1.77	6.50×10^{07}	0.090
1324.596	184148	o	1.0	259642	e	0.0	-2.89	4.84×10^{06}	0.009
1329.427	170988	o	2.0	246208	e	3.0	-2.66	8.24×10^{06}	0.006
1330.695	169673	o	1.0	244821	e	2.0	-3.56	1.02×10^{06}	0.001
1337.995	173072	o	1.0	247810	e	1.0	-2.31	1.85×10^{07}	0.012
1338.052	134575	o	1.0	209311	e	1.0	-1.20	2.34×10^{08}	0.357
1340.339	134703	o	2.0	209311	e	1.0	-2.31	1.83×10^{07}	0.152
1341.409	160630	o	3.0	235179	e	2.0	0.14	5.05×10^{09}	0.536
1352.574	228065	e	1.0	301998	o	0.0	-2.06	3.10×10^{07}	0.028
1354.395	170988	o	2.0	244821	e	2.0	-1.76	6.32×10^{07}	0.010
1359.309	116097	o	2.0	189664	e	3.0	-0.62	8.73×10^{08}	0.384
1359.732	169673	o	1.0	243217	e	1.0	-2.45	1.24×10^{07}	0.004
1360.727	228065	e	1.0	301555	o	1.0	-2.32	1.70×10^{07}	0.005
1362.801	214318	e	4.0	287696	o	3.0	-2.28	1.90×10^{07}	0.017
1373.787	134575	o	1.0	207367	e	2.0	-0.96	3.87×10^{08}	0.270
1376.197	134703	o	2.0	207367	e	2.0	-1.14	2.53×10^{08}	0.225
1378.421	155518	o	1.0	228065	e	1.0	-3.35	1.59×10^{06}	0.009
1384.487	170988	o	2.0	243217	e	1.0	-1.21	2.17×10^{08}	0.047
1387.263	216746	e	2.0	288830	o	1.0	-3.31	1.69×10^{06}	0.003
1387.623	233999	e	0.0	306065	o	1.0	-1.87	4.70×10^{07}	0.011
1393.736	173072	o	1.0	244821	e	2.0	-2.88	4.53×10^{06}	0.003
1395.002	119919	o	3.0	191604	e	2.0	-4.91	4.23×10^{04}	0.001
1396.465	234456	e	1.0	306065	o	1.0	-1.12	2.58×10^{08}	0.040
1397.466	156507	o	2.0	228065	e	1.0	-0.27	1.87×10^{09}	0.461
1397.993	228065	e	1.0	299596	o	2.0	-1.29	1.73×10^{08}	0.012
1407.339	134703	o	2.0	205759	e	3.0	-1.12	2.61×10^{08}	0.092
1409.435	216746	e	2.0	287696	o	3.0	-2.28	1.79×10^{07}	0.011
1409.670	145807	o	2.0	216746	e	2.0	-1.21	2.07×10^{08}	0.078
1410.714	235179	e	2.0	306065	o	1.0	-2.80	5.38×10^{06}	0.003
1412.112	44470	e	0.0	115286	o	1.0	-3.07	2.85×10^{06}	0.003
1413.913	119919	o	3.0	190645	e	4.0	-0.77	5.66×10^{08}	0.389
1415.098	243217	e	1.0	313883	o	1.0	-0.41	1.30×10^{09}	0.621
1415.434	116097	o	2.0	186747	e	3.0	-3.57	8.99×10^{05}	0.004
1415.520	216746	e	2.0	287391	o	2.0	-2.25	1.88×10^{07}	0.030
1425.622	173072	o	1.0	243217	e	1.0	-1.27	1.75×10^{08}	0.062
1428.814	228065	e	1.0	298053	o	1.0	-0.19	2.08×10^{09}	0.748
1433.799	119919	o	3.0	189664	e	3.0	-4.21	2.02×10^{05}	0.000
1433.908	243217	e	1.0	312956	o	2.0	-0.69	6.63×10^{08}	0.662
1437.755	181004	o	2.0	250557	e	2.0	-1.43	1.21×10^{08}	0.024
1447.981	244821	e	2.0	313883	o	1.0	-0.69	6.55×10^{08}	0.203
1462.202	182167	o	3.0	250557	e	2.0	-1.72	6.15×10^{07}	0.014
1467.681	244821	e	2.0	312956	o	2.0	0.02	3.24×10^{09}	0.757
1480.260	233999	e	0.0	301555	o	1.0	-2.57	8.29×10^{06}	0.002
1480.551	234456	e	1.0	301998	o	0.0	-2.31	1.48×10^{07}	0.004
1490.326	234456	e	1.0	301555	o	1.0	-3.11	2.34×10^{06}	0.000
1496.385	119919	o	3.0	186747	e	3.0	-2.34	1.35×10^{07}	0.254
1496.869	181004	o	2.0	247810	e	1.0	-4.84	4.32×10^{04}	0.000
1498.172	246208	e	3.0	312956	o	2.0	0.30	5.97×10^{09}	0.920
1505.806	184148	o	1.0	250557	e	2.0	-1.88	3.95×10^{07}	0.036
1506.566	235179	e	2.0	301555	o	1.0	-1.31	1.46×10^{08}	0.043

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>g</i> <i>f</i>	<i>g</i> <i>A</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1513.487	247810	e	1.0	313883	o	1.0	-0.94	3.31 × 10 ⁰⁸	0.398
1526.571	169673	o	1.0	235179	e	2.0	-3.59	7.25 × 10 ⁰⁵	0.001
1528.832	194233	o	1.0	259642	e	0.0	-2.55	8.08 × 10 ⁰⁶	0.002
1531.218	134703	o	2.0	200010	e	3.0	-1.19	1.83 × 10 ⁰⁸	0.125
1533.655	181004	o	2.0	246208	e	3.0	-1.66	6.18 × 10 ⁰⁷	0.286
1534.964	235179	e	2.0	300327	o	3.0	-2.97	3.07 × 10 ⁰⁶	0.000
1535.023	247810	e	1.0	312956	o	2.0	-0.44	1.02 × 10 ⁰⁹	0.745
1535.146	234456	e	1.0	299596	o	2.0	-1.77	4.75 × 10 ⁰⁷	0.004
1543.562	183025	o	0.0	247810	e	1.0	-1.18	1.85 × 10 ⁰⁸	0.212
1543.615	169673	o	1.0	234456	e	1.0	-1.40	1.10 × 10 ⁰⁸	0.061
1544.111	185795	o	2.0	250557	e	2.0	-0.71	5.62 × 10 ⁰⁸	0.148
1552.383	235179	e	2.0	299596	o	2.0	-0.92	3.32 × 10 ⁰⁸	0.051
1554.564	169673	o	1.0	233999	e	0.0	-0.93	3.18 × 10 ⁰⁸	0.293
1557.844	170988	o	2.0	235179	e	2.0	-0.88	3.60 × 10 ⁰⁸	0.135
1561.190	233999	e	0.0	298053	o	1.0	-0.63	6.43 × 10 ⁰⁸	0.528
1561.505	182167	o	3.0	246208	e	3.0	-0.42	1.04 × 10 ⁰⁹	0.431
1566.981	181004	o	2.0	244821	e	2.0	-0.53	7.99 × 10 ⁰⁸	0.262
1568.096	28411	e	2.0	92183	o	2.0	-2.79	4.44 × 10 ⁰⁶	0.027
1570.776	184148	o	1.0	247810	e	1.0	-0.76	4.76 × 10 ⁰⁸	0.244
1572.391	234456	e	1.0	298053	o	1.0	-0.70	5.41 × 10 ⁰⁸	0.177
1574.711	145807	o	2.0	209311	e	1.0	-2.50	8.56 × 10 ⁰⁶	0.117
1575.597	170988	o	2.0	234456	e	1.0	-0.20	1.70 × 10 ⁰⁹	0.464
1579.135	250557	e	2.0	313883	o	1.0	-0.03	2.43 × 10 ⁰⁹	0.811
1590.480	235179	e	2.0	298053	o	1.0	0.06	3.01 × 10 ⁰⁹	0.765
1591.128	243217	e	1.0	306065	o	1.0	-0.30	1.32 × 10 ⁰⁹	0.351
1596.065	182167	o	3.0	244821	e	2.0	-0.11	2.02 × 10 ⁰⁹	0.374
1602.595	250557	e	2.0	312956	o	2.0	-0.96	2.76 × 10 ⁰⁸	0.332
1607.402	181004	o	2.0	243217	e	1.0	-0.45	9.07 × 10 ⁰⁸	0.283
1610.119	173072	o	1.0	235179	e	2.0	-1.80	4.04 × 10 ⁰⁷	0.048
1612.503	185795	o	2.0	247810	e	1.0	-0.72	4.89 × 10 ⁰⁸	0.211
1624.439	145807	o	2.0	207367	e	2.0	-2.02	2.42 × 10 ⁰⁷	0.044
1629.092	173072	o	1.0	234456	e	1.0	-1.72	4.74 × 10 ⁰⁷	0.029
1632.821	244821	e	2.0	306065	o	1.0	-3.25	1.41 × 10 ⁰⁶	0.001
1633.253	155518	o	1.0	216746	e	2.0	-1.54	7.25 × 10 ⁰⁷	0.140
1641.292	173072	o	1.0	233999	e	0.0	-0.72	4.71 × 10 ⁰⁸	0.384
1645.681	228065	e	1.0	288830	o	1.0	-0.25	1.35 × 10 ⁰⁹	0.518
1648.161	184148	o	1.0	244821	e	2.0	-0.92	2.92 × 10 ⁰⁸	0.197
1655.273	185795	o	2.0	246208	e	3.0	-1.74	4.38 × 10 ⁰⁷	0.058
1660.060	156507	o	2.0	216746	e	2.0	-2.04	2.25 × 10 ⁰⁷	0.065
1661.370	183025	o	0.0	243217	e	1.0	-1.23	1.41 × 10 ⁰⁸	0.171
1668.007	145807	o	2.0	205759	e	3.0	-0.84	3.48 × 10 ⁰⁸	0.296
1675.511	199959	o	1.0	259642	e	0.0	-0.86	3.31 × 10 ⁰⁸	0.164
1685.599	228065	e	1.0	287391	o	2.0	-1.10	1.85 × 10 ⁰⁸	0.057
1692.938	184148	o	1.0	243217	e	1.0	-0.98	2.43 × 10 ⁰⁸	0.139
1694.160	185795	o	2.0	244821	e	2.0	-0.69	4.70 × 10 ⁰⁸	0.144
1701.216	243217	e	1.0	301998	o	0.0	-0.76	4.00 × 10 ⁰⁸	0.340
1712.555	169673	o	1.0	228065	e	1.0	-0.98	2.34 × 10 ⁰⁸	0.372
1714.134	243217	e	1.0	301555	o	1.0	-0.31	1.13 × 10 ⁰⁹	0.379
1716.603	247810	e	1.0	306065	o	1.0	-0.75	4.03 × 10 ⁰⁸	0.317
1741.508	185795	o	2.0	243217	e	1.0	-1.90	2.77 × 10 ⁰⁷	0.011
1752.010	170988	o	2.0	228065	e	1.0	-1.50	6.99 × 10 ⁰⁷	0.125
1753.515	134575	o	1.0	191604	e	2.0	-2.83	3.19 × 10 ⁰⁶	0.010
1757.445	134703	o	2.0	191604	e	2.0	-2.22	1.29 × 10 ⁰⁷	0.040
1762.621	244821	e	2.0	301555	o	1.0	-0.41	8.55 × 10 ⁰⁸	0.342
1772.446	194138	o	3.0	250557	e	2.0	0.08	2.60 × 10 ⁰⁹	0.409

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1773.694	243217	e	1.0	299596	o	2.0	0.29	4.17 × 10 ⁰⁹	0.569
1775.433	194233	o	1.0	250557	e	2.0	-1.01	2.11 × 10 ⁰⁸	0.032
1782.048	160630	o	3.0	216746	e	2.0	-2.10	1.68 × 10 ⁰⁷	0.071
1801.549	250557	e	2.0	306065	o	1.0	-1.70	3.95 × 10 ⁰⁷	0.029
1801.617	244821	e	2.0	300327	o	3.0	0.51	6.74 × 10 ⁰⁹	0.510
1818.407	173072	o	1.0	228065	e	1.0	-1.23	1.22 × 10 ⁰⁸	0.285
1819.469	134703	o	2.0	189664	e	3.0	-1.55	5.77 × 10 ⁰⁷	0.044
1823.603	243217	e	1.0	298053	o	1.0	-1.41	7.80 × 10 ⁰⁷	0.063
1823.796	233999	e	0.0	288830	o	1.0	0.01	2.03 × 10 ⁰⁹	0.664
1825.660	244821	e	2.0	299596	o	2.0	-0.35	9.00 × 10 ⁰⁸	0.201
1839.101	234456	e	1.0	288830	o	1.0	-0.78	3.28 × 10 ⁰⁸	0.085
1843.634	259642	e	0.0	313883	o	1.0	-0.62	4.75 × 10 ⁰⁸	0.724
1844.910	145807	o	2.0	200010	e	3.0	-1.39	7.96 × 10 ⁰⁷	0.057
1845.441	247810	e	1.0	301998	o	0.0	-0.53	5.78 × 10 ⁰⁸	0.544
1845.883	181004	o	2.0	235179	e	2.0	-2.24	1.12 × 10 ⁰⁷	0.007
1847.780	246208	e	3.0	300327	o	3.0	0.22	3.31 × 10 ⁰⁹	0.622
1858.992	155518	o	1.0	209311	e	1.0	-3.14	1.41 × 10 ⁰⁶	0.069
1859.521	194033	o	0.0	247810	e	1.0	-2.28	1.02 × 10 ⁰⁷	0.010
1860.652	247810	e	1.0	301555	o	1.0	-0.20	1.23 × 10 ⁰⁹	0.504
1862.638	160630	o	3.0	214318	e	4.0	-2.26	1.05 × 10 ⁰⁷	0.010
1863.895	235179	e	2.0	288830	o	1.0	-1.25	1.07 × 10 ⁰⁸	0.094
1866.455	194233	o	1.0	247810	e	1.0	-2.15	1.35 × 10 ⁰⁷	0.007
1870.862	181004	o	2.0	234456	e	1.0	-2.35	8.51 × 10 ⁰⁶	0.005
1873.080	246208	e	3.0	299596	o	2.0	-1.58	5.03 × 10 ⁰⁷	0.099
1878.580	244821	e	2.0	298053	o	1.0	-1.21	1.19 × 10 ⁰⁸	0.054
1886.376	182167	o	3.0	235179	e	2.0	-0.94	2.15 × 10 ⁰⁸	0.090
1889.095	234456	e	1.0	287391	o	2.0	0.43	5.10 × 10 ⁰⁹	0.685
1893.800	156507	o	2.0	209311	e	1.0	-2.87	2.54 × 10 ⁰⁶	0.011
1903.638	246208	e	3.0	298739	o	4.0	0.83	1.24 × 10 ¹⁰	0.762
1904.142	235179	e	2.0	287696	o	3.0	0.47	5.49 × 10 ⁰⁹	0.705
1915.265	235179	e	2.0	287391	o	2.0	-0.46	6.37 × 10 ⁰⁸	0.172
1920.492	194138	o	3.0	246208	e	3.0	-1.90	2.27 × 10 ⁰⁷	0.158
1921.451	134703	o	2.0	186747	e	3.0	-0.87	2.44 × 10 ⁰⁸	0.422
1928.692	155518	o	1.0	207367	e	2.0	-3.12	1.35 × 10 ⁰⁶	0.015
1931.039	247810	e	1.0	299596	o	2.0	-0.83	2.64 × 10 ⁰⁸	0.139
1944.375	183025	o	0.0	234456	e	1.0	-1.90	2.20 × 10 ⁰⁷	0.032
1959.582	184148	o	1.0	235179	e	2.0	-2.03	1.63 × 10 ⁰⁷	0.019
1960.869	250557	e	2.0	301555	o	1.0	-1.21	1.05 × 10 ⁰⁸	0.181
1966.186	156507	o	2.0	207367	e	2.0	-3.23	1.02 × 10 ⁰⁶	0.003
1973.036	194138	o	3.0	244821	e	2.0	-1.01	1.66 × 10 ⁰⁸	0.084
1976.355	199959	o	1.0	250557	e	2.0	-1.04	1.62 × 10 ⁰⁸	0.083
1976.738	194233	o	1.0	244821	e	2.0	-1.24	9.89 × 10 ⁰⁷	0.018
1987.755	184148	o	1.0	234456	e	1.0	-2.14	1.22 × 10 ⁰⁷	0.008
1990.343	247810	e	1.0	298053	o	1.0	-3.09	1.36 × 10 ⁰⁶	0.002
2005.301	184148	o	1.0	233999	e	0.0	-2.48	5.44 × 10 ⁰⁶	0.007
2008.601	250557	e	2.0	300327	o	3.0	-1.52	4.87 × 10 ⁰⁷	0.013
2024.299	185795	o	2.0	235179	e	2.0	-3.40	6.52 × 10 ⁰⁵	0.001
2029.721	156507	o	2.0	205759	e	3.0	-2.33	7.66 × 10 ⁰⁶	0.042
2032.552	194033	o	0.0	243217	e	1.0	-1.86	2.21 × 10 ⁰⁷	0.013
2038.547	250557	e	2.0	299596	o	2.0	-0.41	6.05 × 10 ⁰⁸	0.238
2040.844	194233	o	1.0	243217	e	1.0	-2.79	2.57 × 10 ⁰⁶	0.001
2054.393	185795	o	2.0	234456	e	1.0	-2.30	7.82 × 10 ⁰⁶	0.004
2089.138	199959	o	1.0	247810	e	1.0	-0.99	1.60 × 10 ⁰⁸	0.195
2104.782	250557	e	2.0	298053	o	1.0	-1.85	2.04 × 10 ⁰⁷	0.021
2123.689	169673	o	1.0	216746	e	2.0	-1.33	6.67 × 10 ⁰⁷	0.055

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2124.248	181004	o	2.0	228065	e	1.0	-1.39	6.03×10^{07}	0.089
2138.990	160630	o	3.0	207367	e	2.0	-2.54	4.20×10^{06}	0.012
2145.150	213040	o	1.0	259642	e	0.0	-0.21	8.83×10^{08}	0.580
2153.441	259642	e	0.0	306065	o	1.0	-0.03	1.35×10^{09}	0.567
2182.890	145807	o	2.0	191604	e	2.0	-2.05	1.26×10^{07}	0.060
2184.726	170988	o	2.0	216746	e	2.0	-3.92	1.67×10^{05}	0.000
2191.648	243217	e	1.0	288830	o	1.0	-1.33	6.52×10^{07}	0.036
2215.209	160630	o	3.0	205759	e	3.0	-2.91	1.70×10^{06}	0.004
2219.572	183025	o	0.0	228065	e	1.0	-2.64	3.18×10^{06}	0.027
2228.350	199959	o	1.0	244821	e	2.0	-2.65	3.05×10^{06}	0.002
2245.571	169799	o	4.0	214318	e	4.0	-7.10	1.04×10^{02}	0.000
2263.049	243217	e	1.0	287391	o	2.0	-1.49	4.25×10^{07}	0.014
2271.576	244821	e	2.0	288830	o	1.0	-3.43	4.79×10^{05}	0.001
2276.304	184148	o	1.0	228065	e	1.0	-1.96	1.42×10^{07}	0.045
2279.444	145807	o	2.0	189664	e	3.0	-1.75	2.34×10^{07}	0.033
2288.991	173072	o	1.0	216746	e	2.0	-1.72	2.45×10^{07}	0.083
2297.963	156507	o	2.0	200010	e	3.0	-0.82	1.92×10^{08}	0.160
2311.027	199959	o	1.0	243217	e	1.0	-0.52	3.81×10^{08}	0.367
2331.662	244821	e	2.0	287696	o	3.0	-2.83	1.86×10^{06}	0.001
2348.370	244821	e	2.0	287391	o	2.0	-1.94	1.39×10^{07}	0.005
2365.027	185795	o	2.0	228065	e	1.0	-3.00	1.22×10^{06}	0.005
2385.184	259642	e	0.0	301555	o	1.0	-2.92	1.43×10^{06}	0.006
2409.585	209069	o	2.0	250557	e	2.0	-0.71	2.35×10^{08}	0.267
2409.603	246208	e	3.0	287696	o	3.0	-1.90	1.47×10^{07}	0.015
2427.449	246208	e	3.0	287391	o	2.0	-2.36	4.99×10^{06}	0.009
2435.855	194138	o	3.0	235179	e	2.0	-1.70	2.25×10^{07}	0.031
2437.120	247810	e	1.0	288830	o	1.0	-1.79	1.78×10^{07}	0.030
2441.501	194233	o	1.0	235179	e	2.0	0.18	1.70×10^{09}	0.548
2441.877	145807	o	2.0	186747	e	3.0	-0.76	1.98×10^{08}	0.310
2443.363	160630	o	3.0	201545	e	4.0	-0.84	1.63×10^{08}	0.096
2473.122	194033	o	0.0	234456	e	1.0	-0.10	8.59×10^{08}	0.552
2485.408	194233	o	1.0	234456	e	1.0	-0.55	3.01×10^{08}	0.144
2513.929	194233	o	1.0	233999	e	0.0	-0.55	2.91×10^{08}	0.366
2522.066	169673	o	1.0	209311	e	1.0	-2.42	3.86×10^{06}	0.030
2525.731	247810	e	1.0	287391	o	2.0	-1.72	1.96×10^{07}	0.013
2538.610	160630	o	3.0	200010	e	3.0	-1.30	5.13×10^{07}	0.118
2580.439	209069	o	2.0	247810	e	1.0	-0.34	4.64×10^{08}	0.497
2602.663	259642	e	0.0	298053	o	1.0	-3.12	7.61×10^{05}	0.004
2608.613	170988	o	2.0	209311	e	1.0	-4.58	2.58×10^{04}	0.001
2612.042	250557	e	2.0	288830	o	1.0	-3.29	4.72×10^{05}	0.002
2652.145	169673	o	1.0	207367	e	2.0	-1.41	3.56×10^{07}	0.092
2664.666	213040	o	1.0	250557	e	2.0	0.12	1.30×10^{09}	0.503
2691.781	209069	o	2.0	246208	e	3.0	0.40	2.28×10^{09}	0.635
2691.803	250557	e	2.0	287696	o	3.0	-3.14	6.51×10^{05}	0.001
2714.093	250557	e	2.0	287391	o	2.0	-1.51	2.71×10^{07}	0.029
2748.018	170988	o	2.0	207367	e	2.0	-2.47	2.97×10^{06}	0.007
2758.643	173072	o	1.0	209311	e	1.0	-2.77	1.49×10^{06}	0.009
2770.386	155518	o	1.0	191604	e	2.0	-3.05	7.75×10^{05}	0.031
2780.094	169799	o	4.0	205759	e	3.0	-2.06	7.52×10^{06}	0.049
2796.191	209069	o	2.0	244821	e	2.0	0.12	1.12×10^{09}	0.572
2797.059	181004	o	2.0	216746	e	2.0	-1.97	9.03×10^{06}	0.021
2838.469	199959	o	1.0	235179	e	2.0	-0.49	2.69×10^{08}	0.285
2848.434	156507	o	2.0	191604	e	2.0	-1.68	1.70×10^{07}	0.069
2875.100	170988	o	2.0	205759	e	3.0	-1.21	5.00×10^{07}	0.046
2875.182	213040	o	1.0	247810	e	1.0	-0.99	8.39×10^{07}	0.234

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
2891.131	182167	o	3.0	216746	e	2.0	-2.41	3.12×10^{06}	0.040
2897.987	199959	o	1.0	234456	e	1.0	-3.15	5.64×10^{05}	0.001
2915.023	173072	o	1.0	207367	e	2.0	-2.99	7.96×10^{05}	0.002
2927.607	209069	o	2.0	243217	e	1.0	-0.62	1.84×10^{08}	0.511
2936.835	199959	o	1.0	233999	e	0.0	-1.09	6.29×10^{07}	0.176
2937.569	194033	o	0.0	228065	e	1.0	-0.55	2.21×10^{08}	0.392
2954.918	194233	o	1.0	228065	e	1.0	-0.18	5.16×10^{08}	0.508
3015.076	156507	o	2.0	189664	e	3.0	-0.96	8.20×10^{07}	0.267
3066.781	184148	o	1.0	216746	e	2.0	-2.04	6.51×10^{06}	0.050
3077.696	169799	o	4.0	202282	e	5.0	-0.12	5.29×10^{08}	0.382
3109.469	182167	o	3.0	214318	e	4.0	-1.74	1.27×10^{07}	0.041
3145.613	213040	o	1.0	244821	e	2.0	-0.65	1.49×10^{08}	0.160
3149.111	169799	o	4.0	201545	e	4.0	-1.00	6.69×10^{07}	0.221
3227.676	160630	o	3.0	191604	e	2.0	-2.61	1.56×10^{06}	0.030
3230.023	185795	o	2.0	216746	e	2.0	-1.78	1.06×10^{07}	0.052
3305.937	156507	o	2.0	186747	e	3.0	-0.71	1.19×10^{08}	0.259
3309.122	169799	o	4.0	200010	e	3.0	-2.77	1.00×10^{06}	0.065
3312.905	213040	o	1.0	243217	e	1.0	-0.50	1.91×10^{08}	0.365
3330.787	160630	o	3.0	190645	e	4.0	-0.35	2.70×10^{08}	0.335
3425.118	259642	e	0.0	288830	o	1.0	-2.45	2.03×10^{06}	0.009
3443.322	160630	o	3.0	189664	e	3.0	-2.14	4.10×10^{06}	0.019
3444.603	170988	o	2.0	200010	e	3.0	-1.95	6.34×10^{06}	0.027
3531.760	181004	o	2.0	209311	e	1.0	-2.43	1.95×10^{06}	0.097
3556.956	199959	o	1.0	228065	e	1.0	-1.58	1.45×10^{07}	0.053
3792.204	181004	o	2.0	207367	e	2.0	-1.53	1.34×10^{07}	0.113
3803.299	183025	o	0.0	209311	e	1.0	-1.20	2.87×10^{07}	0.287
3827.940	160630	o	3.0	186747	e	3.0	-1.81	6.99×10^{06}	0.112
3828.864	209069	o	2.0	235179	e	2.0	-1.61	1.11×10^{07}	0.022
3937.956	209069	o	2.0	234456	e	1.0	-2.99	4.32×10^{05}	0.001
3967.210	182167	o	3.0	207367	e	2.0	-2.01	4.16×10^{06}	0.110
3972.949	184148	o	1.0	209311	e	1.0	-1.26	2.30×10^{07}	0.218
4038.528	181004	o	2.0	205759	e	3.0	-3.04	3.75×10^{05}	0.003
4237.604	182167	o	3.0	205759	e	3.0	-1.29	1.94×10^{07}	0.112
4251.281	185795	o	2.0	209311	e	1.0	-2.33	1.69×10^{06}	0.159
4305.588	184148	o	1.0	207367	e	2.0	-1.06	3.11×10^{07}	0.154
4422.049	194138	o	3.0	216746	e	2.0	-1.36	1.49×10^{07}	0.154
4440.690	194233	o	1.0	216746	e	2.0	-2.53	1.00×10^{06}	0.013
4478.588	186747	e	3.0	209069	o	2.0	-5.20	2.10×10^{03}	0.024
4515.710	213040	o	1.0	235179	e	2.0	-1.99	3.32×10^{06}	0.011
4558.499	169673	o	1.0	191604	e	2.0	-1.36	1.29×10^{07}	0.185
4634.405	185795	o	2.0	207367	e	2.0	-1.43	1.14×10^{07}	0.128
4663.591	191604	e	2.0	213040	o	1.0	-2.92	3.79×10^{05}	0.058
4668.230	213040	o	1.0	234456	e	1.0	-1.58	7.96×10^{06}	0.037
4769.863	213040	o	1.0	233999	e	0.0	-2.83	4.18×10^{05}	0.007
4795.904	169799	o	4.0	190645	e	4.0	-4.75	5.03×10^{03}	0.000
4849.270	170988	o	2.0	191604	e	2.0	-1.97	2.97×10^{06}	0.081
4954.092	194138	o	3.0	214318	e	4.0	-0.47	9.23×10^{07}	0.263
5007.669	185795	o	2.0	205759	e	3.0	-0.89	3.48×10^{07}	0.166
5032.728	169799	o	4.0	189664	e	3.0	-5.51	8.15×10^{02}	0.000
5151.849	189664	e	3.0	209069	o	2.0	-4.08	2.06×10^{04}	0.043
5159.054	182167	o	3.0	201545	e	4.0	-0.76	4.43×10^{07}	0.209
5260.060	181004	o	2.0	200010	e	3.0	-0.95	2.68×10^{07}	0.199
5262.801	209069	o	2.0	228065	e	1.0	-3.54	7.21×10^{04}	0.004
5352.919	170988	o	2.0	189664	e	3.0	-0.90	3.02×10^{07}	0.218
5394.630	173072	o	1.0	191604	e	2.0	-1.17	1.50×10^{07}	0.199

Table B.6. continued.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
5602.883	182167	o	3.0	200010	e	3.0	-1.95	2.36×10^{06}	0.083
5724.018	191604	e	2.0	209069	o	2.0	-5.09	1.71×10^{03}	0.028
5899.010	169799	o	4.0	186747	e	3.0	-6.03	1.71×10^{02}	0.000
5955.482	199959	o	1.0	216746	e	2.0	-1.06	1.69×10^{07}	0.203
6343.786	170988	o	2.0	186747	e	3.0	-2.13	1.21×10^{06}	0.065
6543.723	194033	o	0.0	209311	e	1.0	-3.36	6.57×10^{04}	0.122
6630.436	194233	o	1.0	209311	e	1.0	-3.71	2.94×10^{04}	0.050
6653.869	213040	o	1.0	228065	e	1.0	-1.88	2.10×10^{06}	0.025
7032.784	185795	o	2.0	200010	e	3.0	-3.41	5.20×10^{04}	0.002
7557.241	194138	o	3.0	207367	e	2.0	-3.33	5.31×10^{04}	0.021
7611.847	194233	o	1.0	207367	e	2.0	-3.29	5.86×10^{04}	0.023
8602.896	194138	o	3.0	205759	e	3.0	-2.39	3.81×10^{05}	0.073
9432.086	181004	o	2.0	191604	e	2.0	-2.83	1.05×10^{05}	0.014
10594.471	182167	o	3.0	191604	e	2.0	-4.61	1.42×10^{03}	0.002
10690.314	199959	o	1.0	209311	e	1.0	-4.34	2.73×10^{03}	0.006
11036.089	200010	e	3.0	209069	o	2.0	-5.24	3.23×10^{02}	0.040
11544.850	181004	o	2.0	189664	e	3.0	-3.19	3.30×10^{04}	0.002
11792.702	182167	o	3.0	190645	e	4.0	-1.79	7.95×10^{05}	0.050
11964.890	191604	e	2.0	199959	o	1.0	-5.93	5.42×10^{01}	0.000
13022.868	209069	o	2.0	216746	e	2.0	-6.32	1.86×10^{01}	0.001
13335.733	182167	o	3.0	189664	e	3.0	-4.09	3.25×10^{03}	0.001
13408.530	184148	o	1.0	191604	e	2.0	-2.97	3.78×10^{04}	0.010
13495.776	199959	o	1.0	207367	e	2.0	-3.50	1.19×10^{04}	0.008
13496.687	194138	o	3.0	201545	e	4.0	-2.70	7.39×10^{04}	0.053
13525.721	186747	e	3.0	194138	o	3.0	-3.26	2.06×10^{04}	0.013
17024.742	194138	o	3.0	200010	e	3.0	-3.01	2.16×10^{04}	0.027
17211.447	185795	o	2.0	191604	e	2.0	-4.34	9.59×10^{02}	0.001
17409.566	181004	o	2.0	186747	e	3.0	-2.54	5.92×10^{04}	0.030
17620.991	207367	e	2.0	213040	o	1.0	-3.32	1.08×10^{04}	0.106
21836.446	182167	o	3.0	186747	e	3.0	-3.53	3.94×10^{03}	0.021
22350.366	189664	e	3.0	194138	o	3.0	-3.43	4.53×10^{03}	0.012
25847.809	185795	o	2.0	189664	e	3.0	-2.87	1.48×10^{04}	0.010
26813.247	209311	e	1.0	213040	o	1.0	-5.56	2.74×10^{01}	0.014
26987.641	213040	o	1.0	216746	e	2.0	-2.13	6.51×10^{04}	0.229
28626.229	190645	e	4.0	194138	o	3.0	-4.00	7.81×10^{02}	0.002
30210.568	205759	e	3.0	209069	o	2.0	-4.08	5.44×10^{02}	0.088
38031.491	191604	e	2.0	194233	o	1.0	-4.28	2.71×10^{02}	0.008
39455.515	191604	e	2.0	194138	o	3.0	-3.48	1.69×10^{03}	0.077
58747.505	207367	e	2.0	209069	o	2.0	-5.01	2.18×10^{01}	0.062
105075.133	185795	o	2.0	186747	e	3.0	-4.44	1.77×10^{01}	0.005

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from Saloman (2004) and Raineri et al. (2009).

Table B.7. Calculated HFR oscillator strengths (log gf) and transition probabilities (gA) in Xe VII. CF is the absolute value of the cancellation factor as defined by Cowan (1981). In cols. 3 and 6, e is written for even and o for odd.

Wavelength ^a / Å	Lower level			Upper level			log gf	gA / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	J	Energy ^b / cm ⁻¹	Parity	J			
204.100	0	e	0.0	489957	o	1.0	-3.88	2.11×10^{07}	0.001
212.402	0	e	0.0	470805	o	1.0	-4.20	9.33×10^{06}	0.002
226.564	0	e	0.0	441376	o	1.0	-2.58	3.41×10^{08}	0.005
235.534	0	e	0.0	424567	o	1.0	-3.76	2.10×10^{07}	0.037

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
243.296	0	e	0.0	411022	o	1.0	-1.90	1.42×10^{09}	0.108
245.217	0	e	0.0	407802	o	1.0	-1.07	9.39×10^{09}	0.422
249.443	0	e	0.0	400893	o	1.0	-1.52	3.26×10^{09}	0.444
263.263	96141	o	0.0	475990	e	1.0	-3.14	7.02×10^{07}	0.043
266.121	100451	o	1.0	476220	e	2.0	-2.59	2.44×10^{08}	0.070
266.284	100451	o	1.0	475990	e	1.0	-3.30	4.76×10^{07}	0.039
275.388	113676	o	2.0	476800	e	3.0	-2.24	5.05×10^{08}	0.100
275.829	113676	o	2.0	476220	e	2.0	-3.04	8.04×10^{07}	0.079
276.004	113676	o	2.0	475990	e	1.0	-4.27	4.65×10^{06}	0.053
300.335	143259	o	1.0	476220	e	2.0	-4.45	2.61×10^{06}	0.003
300.543	143259	o	1.0	475990	e	1.0	-3.79	1.18×10^{07}	0.118
316.550	100451	o	1.0	416357	e	2.0	-2.55	1.88×10^{08}	0.039
319.871	96141	o	0.0	408767	e	1.0	-2.54	1.87×10^{08}	0.105
324.343	100451	o	1.0	408767	e	1.0	-2.70	1.27×10^{08}	0.100
326.914	100451	o	1.0	406342	e	2.0	-2.07	5.29×10^{08}	0.118
330.381	113676	o	2.0	416357	e	2.0	-4.59	1.59×10^{06}	0.008
338.879	113676	o	2.0	408767	e	1.0	-3.91	7.19×10^{06}	0.090
341.686	113676	o	2.0	406342	e	2.0	-2.75	1.02×10^{08}	0.102
343.285	113676	o	2.0	404979	e	3.0	-2.04	5.22×10^{08}	0.103
349.211	100451	o	1.0	386811	e	2.0	-2.34	2.52×10^{08}	0.179
351.678	113676	o	2.0	398027	e	3.0	-3.93	6.30×10^{06}	0.109
366.119	113676	o	2.0	386811	e	2.0	-3.26	2.75×10^{07}	0.163
366.169	143259	o	1.0	416357	e	2.0	-0.85	7.10×10^{09}	0.176
367.991	113676	o	2.0	385422	e	3.0	-2.28	2.59×10^{08}	0.146
372.190	113676	o	2.0	382356	e	3.0	-3.61	1.18×10^{07}	0.146
375.539	223673	e	0.0	489957	o	1.0	-3.28	2.50×10^{07}	0.002
376.636	143259	o	1.0	408767	e	1.0	-4.29	2.40×10^{06}	0.069
380.108	143259	o	1.0	406342	e	2.0	-2.11	3.56×10^{08}	0.109
382.819	100451	o	1.0	361671	e	0.0	-1.59	1.17×10^{09}	0.789
386.560	96141	o	0.0	354833	e	1.0	-0.70	9.00×10^{09}	0.876
391.739	234685	e	1.0	489957	o	1.0	-1.30	2.17×10^{09}	0.770
393.110	100451	o	1.0	354833	e	1.0	-0.24	2.47×10^{10}	0.876
393.923	236100	e	2.0	489957	o	1.0	-0.37	1.85×10^{10}	0.262
398.804	234685	e	1.0	485435	o	2.0	-0.35	1.87×10^{10}	0.831
401.067	236100	e	2.0	485435	o	2.0	-0.35	1.86×10^{10}	0.818
404.642	223673	e	0.0	470805	o	1.0	-0.43	1.50×10^{10}	0.750
410.590	143259	o	1.0	386811	e	2.0	-1.61	9.72×10^{08}	0.216
414.668	113676	o	2.0	354833	e	1.0	-0.03	3.64×10^{10}	0.872
419.985	251853	e	2.0	489957	o	1.0	-0.25	2.14×10^{10}	0.567
423.513	234685	e	1.0	470805	o	1.0	-0.71	7.21×10^{09}	0.755
426.067	236100	e	2.0	470805	o	1.0	-0.32	1.78×10^{10}	0.559
427.182	234685	e	1.0	468777	o	0.0	-0.50	1.15×10^{10}	0.768
428.115	251853	e	2.0	485435	o	2.0	-0.10	2.93×10^{10}	0.811
431.779	236100	e	2.0	467700	o	3.0	-2.65	7.95×10^{07}	0.001
438.564	234685	e	1.0	462702	o	2.0	-3.31	1.70×10^{07}	0.901
441.129	236100	e	2.0	462791	o	3.0	-2.75	6.15×10^{07}	0.143
441.302	236100	e	2.0	462702	o	2.0	-3.44	1.24×10^{07}	0.259
456.721	251853	e	2.0	470805	o	1.0	-1.32	1.52×10^{09}	0.060
457.850	143259	o	1.0	361671	e	0.0	-0.25	1.80×10^{10}	0.810
459.341	223673	e	0.0	441376	o	1.0	-2.85	4.50×10^{07}	0.001
461.363	273208	e	0.0	489957	o	1.0	-0.32	1.50×10^{10}	0.878
463.291	251853	e	2.0	467700	o	3.0	-1.78	5.21×10^{08}	0.006
472.648	143259	o	1.0	354833	e	1.0	-1.74	5.45×10^{08}	0.813
474.073	251853	e	2.0	462791	o	3.0	-3.15	2.11×10^{07}	0.060
474.273	251853	e	2.0	462702	o	2.0	-4.68	6.13×10^{05}	0.016

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
482.880	100451	o	1.0	307542	e	2.0	-0.97	3.10 × 10 ⁰⁹	0.209
483.814	234685	e	1.0	441376	o	1.0	-1.77	4.82 × 10 ⁰⁸	0.084
487.149	236100	e	2.0	441376	o	1.0	-1.54	8.05 × 10 ⁰⁸	0.021
489.670	272581	o	2.0	476800	e	3.0	-4.63	6.58 × 10 ⁰⁵	0.229
490.225	272812	o	3.0	476800	e	3.0	-3.22	1.68 × 10 ⁰⁷	0.204
491.065	272581	o	2.0	476220	e	2.0	-3.19	1.78 × 10 ⁰⁷	0.205
491.268	273245	o	4.0	476800	e	3.0	-2.36	1.21 × 10 ⁰⁸	0.162
491.620	272581	o	2.0	475990	e	1.0	-2.60	6.90 × 10 ⁰⁷	0.162
491.623	272812	o	3.0	476220	e	2.0	-2.49	8.95 × 10 ⁰⁷	0.157
494.247	236100	e	2.0	438428	o	3.0	0.25	4.85 × 10 ¹⁰	0.154
494.597	287772	e	1.0	489957	o	1.0	-3.61	6.75 × 10 ⁰⁶	0.076
496.907	288712	e	2.0	489957	o	1.0	-2.23	1.59 × 10 ⁰⁸	0.228
497.775	223673	e	0.0	424567	o	1.0	-2.16	1.88 × 10 ⁰⁸	0.004
505.912	287772	e	1.0	485435	o	2.0	-3.82	3.95 × 10 ⁰⁶	0.112
506.081	273208	e	0.0	470805	o	1.0	-1.59	6.62 × 10 ⁰⁸	0.093
506.283	279282	o	3.0	476800	e	3.0	-4.58	6.82 × 10 ⁰⁵	0.237
507.774	279282	o	3.0	476220	e	2.0	-3.69	5.26 × 10 ⁰⁶	0.070
508.329	288712	e	2.0	485435	o	2.0	-2.84	3.77 × 10 ⁰⁷	0.069
512.571	290340	e	3.0	485435	o	2.0	-1.98	2.64 × 10 ⁰⁸	0.107
515.820	113676	o	2.0	307542	e	2.0	-2.90	3.13 × 10 ⁰⁷	0.043
521.836	96141	o	0.0	287772	e	1.0	0.02	2.59 × 10 ¹⁰	0.866
524.799	234685	e	1.0	425234	o	2.0	-0.45	8.52 × 10 ⁰⁹	0.089
526.643	234685	e	1.0	424567	o	1.0	0.09	2.93 × 10 ¹⁰	0.844
527.640	251853	e	2.0	441376	o	1.0	-2.65	5.43 × 10 ⁰⁷	0.002
527.696	234685	e	1.0	424188	o	0.0	-0.24	1.39 × 10 ¹⁰	0.787
528.726	236100	e	2.0	425234	o	2.0	-0.20	1.50 × 10 ¹⁰	0.304
530.597	236100	e	2.0	424567	o	1.0	-0.57	6.36 × 10 ⁰⁹	0.630
531.177	100451	o	1.0	288712	e	2.0	0.36	5.47 × 10 ¹⁰	0.845
533.763	223673	e	0.0	411022	o	1.0	0.29	4.58 × 10 ¹⁰	0.857
533.843	100451	o	1.0	287772	e	1.0	-0.13	1.75 × 10 ¹⁰	0.863
534.965	236100	e	2.0	423028	o	3.0	0.51	7.53 × 10 ¹⁰	0.683
535.977	251853	e	2.0	438428	o	3.0	0.44	6.30 × 10 ¹⁰	0.369
543.098	223673	e	0.0	407802	o	1.0	-0.73	4.25 × 10 ⁰⁹	0.508
546.350	287772	e	1.0	470805	o	1.0	-2.57	6.03 × 10 ⁰⁷	0.130
547.780	234685	e	1.0	417240	o	2.0	0.41	5.63 × 10 ¹⁰	0.882
548.201	307542	e	2.0	489957	o	1.0	-0.24	1.28 × 10 ¹⁰	0.732
549.170	288712	e	2.0	470805	o	1.0	-2.31	1.09 × 10 ⁰⁸	0.061
552.059	236100	e	2.0	417240	o	2.0	-0.24	1.25 × 10 ¹⁰	0.214
552.471	287772	e	1.0	468777	o	0.0	-2.39	8.97 × 10 ⁰⁷	0.143
558.697	288712	e	2.0	467700	o	3.0	-1.26	1.18 × 10 ⁰⁹	0.602
562.136	307542	e	2.0	485435	o	2.0	-2.46	7.38 × 10 ⁰⁷	0.627
563.825	290340	e	3.0	467700	o	3.0	-2.21	1.29 × 10 ⁰⁸	0.727
564.270	223673	e	0.0	400893	o	1.0	-1.81	3.23 × 10 ⁰⁸	0.294
566.046	113676	o	2.0	290340	e	3.0	0.61	8.47 × 10 ¹⁰	0.857
567.096	234685	e	1.0	411022	o	1.0	-0.46	7.23 × 10 ⁰⁹	0.249
571.311	113676	o	2.0	288712	e	2.0	-0.13	1.51 × 10 ¹⁰	0.857
571.657	287772	e	1.0	462702	o	2.0	0.54	6.98 × 10 ¹⁰	0.866
571.683	236100	e	2.0	411022	o	1.0	-1.49	6.61 × 10 ⁰⁸	0.050
574.396	113676	o	2.0	287772	e	1.0	-1.32	9.71 × 10 ⁰⁸	0.857
574.452	288712	e	2.0	462791	o	3.0	0.71	1.03 × 10 ¹¹	0.860
574.746	288712	e	2.0	462702	o	2.0	-0.22	1.22 × 10 ¹⁰	0.808
575.831	234685	e	1.0	408347	o	2.0	-0.71	3.92 × 10 ⁰⁹	0.890
576.764	251853	e	2.0	425234	o	2.0	0.39	4.91 × 10 ¹⁰	0.806
577.644	234685	e	1.0	407802	o	1.0	-1.65	4.42 × 10 ⁰⁸	0.121
578.640	290340	e	3.0	463159	o	4.0	0.87	1.48 × 10 ¹¹	0.861

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
578.848	100451	o	1.0	273208	e	0.0	-1.91	2.47 × 10 ⁰⁸	0.045
578.992	251853	e	2.0	424567	o	1.0	-0.33	9.23 × 10 ⁰⁹	0.675
579.875	290340	e	3.0	462791	o	3.0	-0.22	1.19 × 10 ¹⁰	0.778
580.174	290340	e	3.0	462702	o	2.0	-1.79	3.21 × 10 ⁰⁸	0.715
580.562	236100	e	2.0	408347	o	2.0	-0.43	7.41 × 10 ⁰⁹	0.475
582.404	236100	e	2.0	407802	o	1.0	-0.68	4.16 × 10 ⁰⁹	0.262
584.197	251853	e	2.0	423028	o	3.0	0.42	5.15 × 10 ¹⁰	0.435
588.710	234685	e	1.0	404548	o	2.0	-0.01	1.89 × 10 ¹⁰	0.806
593.655	236100	e	2.0	404548	o	2.0	-0.06	1.64 × 10 ¹⁰	0.381
594.643	273208	e	0.0	441376	o	1.0	0.27	3.52 × 10 ¹⁰	0.656
601.656	234685	e	1.0	400893	o	1.0	-5.67	3.91 × 10 ⁰⁴	0.000
602.479	234685	e	1.0	400666	o	0.0	-2.91	2.27 × 10 ⁰⁷	0.059
604.642	251853	e	2.0	417240	o	2.0	-0.66	4.05 × 10 ⁰⁹	0.077
604.913	236100	e	2.0	401413	o	3.0	-0.41	7.09 × 10 ⁰⁹	0.538
606.822	236100	e	2.0	400893	o	1.0	-1.04	1.65 × 10 ⁰⁹	0.382
608.706	143259	o	1.0	307542	e	2.0	0.69	8.83 × 10 ¹⁰	0.791
612.509	307542	e	2.0	470805	o	1.0	-0.84	2.60 × 10 ⁰⁹	0.537
624.383	307542	e	2.0	467700	o	3.0	0.91	1.38 × 10 ¹¹	0.844
628.263	251853	e	2.0	411022	o	1.0	-3.50	5.40 × 10 ⁰⁶	0.001
628.508	234685	e	1.0	393792	o	2.0	-1.75	2.98 × 10 ⁰⁸	0.262
634.148	236100	e	2.0	393792	o	2.0	-0.40	6.63 × 10 ⁰⁹	0.855
639.002	251853	e	2.0	408347	o	2.0	-0.83	2.43 × 10 ⁰⁹	0.236
641.235	251853	e	2.0	407802	o	1.0	-0.66	3.53 × 10 ⁰⁹	0.343
644.127	307542	e	2.0	462791	o	3.0	-1.69	3.26 × 10 ⁰⁸	0.358
644.496	307542	e	2.0	462702	o	2.0	-2.47	5.39 × 10 ⁰⁷	0.487
651.025	287772	e	1.0	441376	o	1.0	-1.99	1.61 × 10 ⁰⁸	0.086
654.900	251853	e	2.0	404548	o	2.0	-1.05	1.39 × 10 ⁰⁹	0.040
655.033	288712	e	2.0	441376	o	1.0	-1.29	8.08 × 10 ⁰⁸	0.243
660.493	100451	o	1.0	251853	e	2.0	-0.42	5.80 × 10 ⁰⁹	0.351
660.681	273208	e	0.0	424567	o	1.0	-2.50	4.82 × 10 ⁰⁷	0.012
667.931	288712	e	2.0	438428	o	3.0	-2.38	6.09 × 10 ⁰⁷	0.013
668.628	251853	e	2.0	401413	o	3.0	-1.05	1.33 × 10 ⁰⁹	0.128
670.961	251853	e	2.0	400893	o	1.0	-1.44	5.35 × 10 ⁰⁸	0.186
675.274	290340	e	3.0	438428	o	3.0	-0.84	2.08 × 10 ⁰⁹	0.647
687.507	143259	o	1.0	288712	e	2.0	-1.87	1.90 × 10 ⁰⁸	0.067
691.979	143259	o	1.0	287772	e	1.0	-1.66	3.06 × 10 ⁰⁸	0.800
695.526	272581	o	2.0	416357	e	2.0	-2.31	6.88 × 10 ⁰⁷	0.038
696.646	272812	o	3.0	416357	e	2.0	-0.79	2.27 × 10 ⁰⁹	0.516
698.036	0	e	0.0	143259	o	1.0	0.19	2.10 × 10 ¹⁰	0.719
704.528	251853	e	2.0	393792	o	2.0	-1.34	6.10 × 10 ⁰⁸	0.141
720.778	272812	o	3.0	411551	e	4.0	-0.90	1.58 × 10 ⁰⁹	0.305
721.792	96141	o	0.0	234685	e	1.0	-0.26	6.99 × 10 ⁰⁹	0.852
723.034	273245	o	4.0	411551	e	4.0	-0.71	2.47 × 10 ⁰⁹	0.890
723.709	113676	o	2.0	251853	e	2.0	0.12	1.66 × 10 ¹⁰	0.819
725.616	273208	e	0.0	411022	o	1.0	-2.84	1.83 × 10 ⁰⁷	0.002
727.474	287772	e	1.0	425234	o	2.0	-0.74	2.30 × 10 ⁰⁹	0.658
729.528	279282	o	3.0	416357	e	2.0	0.18	1.90 × 10 ¹⁰	0.676
731.021	287772	e	1.0	424567	o	1.0	-0.17	8.37 × 10 ⁰⁹	0.676
732.483	288712	e	2.0	425234	o	2.0	0.00	1.23 × 10 ¹⁰	0.622
733.052	287772	e	1.0	424188	o	0.0	-0.47	4.17 × 10 ⁰⁹	0.586
734.290	272581	o	2.0	408767	e	1.0	-0.01	1.20 × 10 ¹⁰	0.849
736.079	288712	e	2.0	424567	o	1.0	-0.52	3.75 × 10 ⁰⁹	0.192
737.197	100451	o	1.0	236100	e	2.0	-0.44	4.45 × 10 ⁰⁹	0.470
740.061	354833	e	1.0	489957	o	1.0	-0.79	1.96 × 10 ⁰⁹	0.642
741.323	290340	e	3.0	425234	o	2.0	-0.40	4.90 × 10 ⁰⁹	0.170

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
742.975	273208	e	0.0	407802	o	1.0	-3.04	1.09 × 10 ⁰⁷	0.004
744.513	288712	e	2.0	423028	o	3.0	-0.31	5.91 × 10 ⁰⁹	0.457
744.968	100451	o	1.0	234685	e	1.0	-0.42	4.61 × 10 ⁰⁹	0.849
747.194	307542	e	2.0	441376	o	1.0	-0.28	6.33 × 10 ⁰⁹	0.198
747.602	272581	o	2.0	406342	e	2.0	-0.15	8.49 × 10 ⁰⁹	0.909
748.895	272812	o	3.0	406342	e	2.0	-0.09	9.71 × 10 ⁰⁹	0.461
753.648	290340	e	3.0	423028	o	3.0	0.07	1.37 × 10 ¹⁰	0.521
755.298	272581	o	2.0	404979	e	3.0	-1.18	7.81 × 10 ⁰⁸	0.892
756.035	279282	o	3.0	411551	e	4.0	0.18	1.76 × 10 ¹⁰	0.445
756.619	272812	o	3.0	404979	e	3.0	-0.10	9.32 × 10 ⁰⁹	0.814
759.105	273245	o	4.0	404979	e	3.0	0.04	1.28 × 10 ¹⁰	0.488
764.024	307542	e	2.0	438428	o	3.0	0.28	2.17 × 10 ¹⁰	0.205
765.685	354833	e	1.0	485435	o	2.0	0.16	1.65 × 10 ¹⁰	0.657
769.533	143259	o	1.0	273208	e	0.0	-0.25	6.34 × 10 ⁰⁹	0.508
772.392	287772	e	1.0	417240	o	2.0	-0.71	2.17 × 10 ⁰⁹	0.302
778.041	288712	e	2.0	417240	o	2.0	-1.19	7.12 × 10 ⁰⁸	0.041
779.120	273245	o	4.0	401595	e	5.0	0.41	2.78 × 10 ¹⁰	0.692
779.508	361671	e	0.0	489957	o	1.0	-0.04	1.01 × 10 ¹⁰	0.616
783.177	273208	e	0.0	400893	o	1.0	-4.37	4.61 × 10 ⁰⁵	0.002
786.318	272812	o	3.0	399987	e	4.0	0.17	1.58 × 10 ¹⁰	0.743
787.030	279282	o	3.0	406342	e	2.0	-1.23	6.43 × 10 ⁰⁸	0.361
788.022	290340	e	3.0	417240	o	2.0	-0.10	8.61 × 10 ⁰⁹	0.594
789.004	273245	o	4.0	399987	e	4.0	-0.04	9.76 × 10 ⁰⁹	0.412
795.564	279282	o	3.0	404979	e	3.0	-0.67	2.27 × 10 ⁰⁹	0.936
797.156	272581	o	2.0	398027	e	3.0	-0.08	8.72 × 10 ⁰⁹	0.721
798.626	272812	o	3.0	398027	e	3.0	-0.56	2.89 × 10 ⁰⁹	0.245
801.398	273245	o	4.0	398027	e	3.0	-1.00	1.05 × 10 ⁰⁹	0.668
811.359	287772	e	1.0	411022	o	1.0	-1.09	8.20 × 10 ⁰⁸	0.076
811.543	100451	o	1.0	223673	e	0.0	-0.32	4.82 × 10 ⁰⁹	0.811
816.833	113676	o	2.0	236100	e	2.0	-0.21	6.18 × 10 ⁰⁹	0.837
817.595	288712	e	2.0	411022	o	1.0	-0.13	7.34 × 10 ⁰⁹	0.630
818.150	290340	e	3.0	412567	o	4.0	0.14	1.38 × 10 ¹⁰	0.360
826.385	113676	o	2.0	234685	e	1.0	-0.23	5.78 × 10 ⁰⁹	0.836
828.466	279282	o	3.0	399987	e	4.0	-2.31	4.81 × 10 ⁰⁷	0.526
829.359	287772	e	1.0	408347	o	2.0	-1.36	4.21 × 10 ⁰⁸	0.205
833.125	287772	e	1.0	407802	o	1.0	-0.94	1.12 × 10 ⁰⁹	0.354
835.876	288712	e	2.0	408347	o	2.0	-0.93	1.12 × 10 ⁰⁹	0.137
839.701	288712	e	2.0	407802	o	1.0	-1.71	1.83 × 10 ⁰⁸	0.027
842.141	279282	o	3.0	398027	e	3.0	-0.17	6.38 × 10 ⁰⁹	0.821
847.407	290340	e	3.0	408347	o	2.0	0.27	1.74 × 10 ¹⁰	0.802
849.675	307542	e	2.0	425234	o	2.0	-2.25	5.17 × 10 ⁰⁷	0.025
854.518	307542	e	2.0	424567	o	1.0	-2.58	2.42 × 10 ⁰⁷	0.046
856.340	287772	e	1.0	404548	o	2.0	-2.48	3.06 × 10 ⁰⁷	0.008
862.277	354833	e	1.0	470805	o	1.0	-0.18	5.89 × 10 ⁰⁹	0.647
863.289	288712	e	2.0	404548	o	2.0	-0.69	1.86 × 10 ⁰⁹	0.166
865.906	307542	e	2.0	423028	o	3.0	-1.24	5.09 × 10 ⁰⁸	0.082
875.427	272581	o	2.0	386811	e	2.0	-0.15	6.19 × 10 ⁰⁹	0.552
875.595	290340	e	3.0	404548	o	2.0	-3.04	7.99 × 10 ⁰⁶	0.000
877.201	272812	o	3.0	386811	e	2.0	-0.27	4.67 × 10 ⁰⁹	0.896
877.624	354833	e	1.0	468777	o	0.0	-0.58	2.27 × 10 ⁰⁹	0.648
882.145	272812	o	3.0	386172	e	4.0	-0.34	3.94 × 10 ⁰⁹	0.240
884.009	287772	e	1.0	400893	o	1.0	-0.65	1.93 × 10 ⁰⁹	0.553
885.528	273245	o	4.0	386172	e	4.0	0.12	1.13 × 10 ¹⁰	0.903
885.787	287772	e	1.0	400666	o	0.0	-0.44	3.06 × 10 ⁰⁹	0.591
886.203	272581	o	2.0	385422	e	3.0	-2.89	1.09 × 10 ⁰⁷	0.003

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
887.304	288712	e	2.0	401413	o	3.0	-0.17	5.73 × 10 ⁰⁹	0.262
888.021	272812	o	3.0	385422	e	3.0	-0.32	4.06 × 10 ⁰⁹	0.340
891.417	288712	e	2.0	400893	o	1.0	-0.23	5.01 × 10 ⁰⁹	0.495
891.448	273245	o	4.0	385422	e	3.0	-0.07	7.25 × 10 ⁰⁹	0.877
900.309	290340	e	3.0	401413	o	3.0	-0.42	3.12 × 10 ⁰⁹	0.542
910.954	272581	o	2.0	382356	e	3.0	-0.20	5.08 × 10 ⁰⁹	0.474
911.594	307542	e	2.0	417240	o	2.0	-1.23	4.71 × 10 ⁰⁸	0.061
912.875	272812	o	3.0	382356	e	3.0	-0.44	2.91 × 10 ⁰⁹	0.829
916.305	361671	e	0.0	470805	o	1.0	-0.67	1.71 × 10 ⁰⁹	0.591
916.498	273245	o	4.0	382356	e	3.0	-3.44	2.85 × 10 ⁰⁶	0.005
920.861	143259	o	1.0	251853	e	2.0	-0.68	1.65 × 10 ⁰⁹	0.117
929.982	279282	o	3.0	386811	e	2.0	-1.05	6.98 × 10 ⁰⁸	0.449
935.541	279282	o	3.0	386172	e	4.0	-0.73	1.42 × 10 ⁰⁹	0.437
942.152	279282	o	3.0	385422	e	3.0	-0.32	3.63 × 10 ⁰⁹	0.911
943.218	287772	e	1.0	393792	o	2.0	-0.33	3.53 × 10 ⁰⁹	0.357
951.656	288712	e	2.0	393792	o	2.0	-0.74	1.35 × 10 ⁰⁹	0.421
966.370	307542	e	2.0	411022	o	1.0	-1.99	7.27 × 10 ⁰⁷	0.016
966.632	290340	e	3.0	393792	o	2.0	-2.55	1.99 × 10 ⁰⁷	0.049
969.500	386811	e	2.0	489957	o	1.0	-2.25	3.99 × 10 ⁰⁷	0.328
970.130	382356	e	3.0	485435	o	2.0	-4.07	6.13 × 10 ⁰⁵	0.456
970.177	279282	o	3.0	382356	e	3.0	-0.27	3.74 × 10 ⁰⁹	0.841
992.014	307542	e	2.0	408347	o	2.0	-1.50	2.15 × 10 ⁰⁸	0.058
995.510	0	e	0.0	100451	o	1.0	-1.40	2.68 × 10 ⁰⁸	0.639
997.407	307542	e	2.0	407802	o	1.0	-0.12	5.10 × 10 ⁰⁹	0.538
999.870	385422	e	3.0	485435	o	2.0	-2.70	1.34 × 10 ⁰⁷	0.608
1013.952	386811	e	2.0	485435	o	2.0	-3.88	8.43 × 10 ⁰⁵	0.318
1030.864	307542	e	2.0	404548	o	2.0	-1.06	5.43 × 10 ⁰⁸	0.091
1065.292	307542	e	2.0	401413	o	3.0	-1.02	5.55 × 10 ⁰⁸	0.328
1071.226	307542	e	2.0	400893	o	1.0	-0.81	9.11 × 10 ⁰⁸	0.366
1077.110	143259	o	1.0	236100	e	2.0	-0.56	1.60 × 10 ⁰⁹	0.111
1093.781	143259	o	1.0	234685	e	1.0	-2.01	5.53 × 10 ⁰⁷	0.781
1144.060	398027	e	3.0	485435	o	2.0	-4.21	3.11 × 10 ⁰⁵	0.426
1155.495	354833	e	1.0	441376	o	1.0	-3.94	5.72 × 10 ⁰⁵	0.039
1159.420	307542	e	2.0	393792	o	2.0	-1.68	1.04 × 10 ⁰⁸	0.056
1171.729	382356	e	3.0	467700	o	3.0	-3.04	4.44 × 10 ⁰⁶	0.024
1190.561	386811	e	2.0	470805	o	1.0	-3.62	1.12 × 10 ⁰⁶	0.029
1195.958	406342	e	2.0	489957	o	1.0	-2.34	2.13 × 10 ⁰⁷	0.401
1204.703	393792	o	2.0	476800	e	3.0	-3.05	4.17 × 10 ⁰⁶	0.108
1213.180	393792	o	2.0	476220	e	2.0	-1.73	8.46 × 10 ⁰⁷	0.372
1215.392	385422	e	3.0	467700	o	3.0	-3.09	3.66 × 10 ⁰⁶	0.024
1216.575	393792	o	2.0	475990	e	1.0	-1.04	4.13 × 10 ⁰⁸	0.448
1226.572	386172	e	4.0	467700	o	3.0	-5.25	2.49 × 10 ⁰⁴	0.000
1231.679	408767	e	1.0	489957	o	1.0	-3.64	1.01 × 10 ⁰⁶	0.687
1236.262	386811	e	2.0	467700	o	3.0	-1.44	1.57 × 10 ⁰⁸	0.370
1237.578	382356	e	3.0	463159	o	4.0	-3.05	3.95 × 10 ⁰⁶	0.252
1242.915	404979	e	3.0	485435	o	2.0	-2.25	2.45 × 10 ⁰⁷	0.742
1243.240	382356	e	3.0	462791	o	3.0	-3.72	8.40 × 10 ⁰⁵	0.016
1243.565	143259	o	1.0	223673	e	0.0	-1.96	4.69 × 10 ⁰⁷	0.065
1244.617	382356	e	3.0	462702	o	2.0	-4.15	3.07 × 10 ⁰⁵	0.001
1254.626	361671	e	0.0	441376	o	1.0	-1.69	8.72 × 10 ⁰⁷	0.266
1264.334	406342	e	2.0	485435	o	2.0	-2.99	4.27 × 10 ⁰⁶	0.616
1286.389	385422	e	3.0	463159	o	4.0	-2.08	3.34 × 10 ⁰⁷	0.170
1292.507	385422	e	3.0	462791	o	3.0	-2.05	3.55 × 10 ⁰⁷	0.366
1293.996	385422	e	3.0	462702	o	2.0	-3.35	1.78 × 10 ⁰⁶	0.038
1298.921	386172	e	4.0	463159	o	4.0	-2.35	1.79 × 10 ⁰⁷	0.214

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1304.325	408767	e	1.0	485435	o	2.0	-4.05	3.47 × 10 ⁰⁵	0.692
1305.159	386172	e	4.0	462791	o	3.0	-4.39	1.59 × 10 ⁰⁵	0.001
1316.136	386811	e	2.0	462791	o	3.0	-2.93	4.48 × 10 ⁰⁶	0.057
1317.679	386811	e	2.0	462702	o	2.0	-2.10	3.05 × 10 ⁰⁷	0.568
1326.489	401413	o	3.0	476800	e	3.0	-1.92	4.56 × 10 ⁰⁷	0.266
1327.545	400893	o	1.0	476220	e	2.0	0.40	9.49 × 10 ⁰⁹	0.737
1327.598	400666	o	0.0	475990	e	1.0	0.10	4.78 × 10 ⁰⁹	0.702
1331.611	400893	o	1.0	475990	e	1.0	-0.16	2.56 × 10 ⁰⁹	0.652
1336.773	401413	o	3.0	476220	e	2.0	-0.92	4.52 × 10 ⁰⁸	0.399
1358.696	416357	e	2.0	489957	o	1.0	-1.56	9.79 × 10 ⁰⁷	0.286
1384.045	404548	o	2.0	476800	e	3.0	0.13	4.71 × 10 ⁰⁹	0.738
1395.245	404548	o	2.0	476220	e	2.0	-0.68	7.16 × 10 ⁰⁸	0.468
1399.737	404548	o	2.0	475990	e	1.0	-1.37	1.43 × 10 ⁰⁸	0.439
1420.434	354833	e	1.0	425234	o	2.0	-1.55	9.37 × 10 ⁰⁷	0.257
1434.021	354833	e	1.0	424567	o	1.0	-1.89	4.21 × 10 ⁰⁷	0.181
1435.276	398027	e	3.0	467700	o	3.0	-2.78	5.40 × 10 ⁰⁶	0.047
1441.857	354833	e	1.0	424188	o	0.0	-2.42	1.21 × 10 ⁰⁷	0.140
1447.639	416357	e	2.0	485435	o	2.0	-3.77	5.38 × 10 ⁰⁵	0.426
1460.856	408347	o	2.0	476800	e	3.0	0.57	1.19 × 10 ¹⁰	0.743
1461.604	407802	o	1.0	476220	e	2.0	-0.53	9.18 × 10 ⁰⁸	0.271
1466.534	407802	o	1.0	475990	e	1.0	-0.73	5.78 × 10 ⁰⁸	0.661
1473.340	408347	o	2.0	476220	e	2.0	-0.18	2.02 × 10 ⁰⁹	0.641
1476.821	399987	e	4.0	467700	o	3.0	-3.98	3.24 × 10 ⁰⁵	0.021
1478.350	408347	o	2.0	475990	e	1.0	-1.65	6.80 × 10 ⁰⁷	0.181
1533.789	411022	o	1.0	476220	e	2.0	-0.98	3.00 × 10 ⁰⁸	0.290
1535.344	398027	e	3.0	463159	o	4.0	-5.45	9.90 × 10 ⁰³	0.001
1539.219	411022	o	1.0	475990	e	1.0	-1.50	8.91 × 10 ⁰⁷	0.222
1544.068	398027	e	3.0	462791	o	3.0	-2.56	7.65 × 10 ⁰⁶	0.200
1546.193	398027	e	3.0	462702	o	2.0	-3.65	6.23 × 10 ⁰⁵	0.007
1551.277	406342	e	2.0	470805	o	1.0	-3.18	1.80 × 10 ⁰⁶	0.061
1556.832	412567	o	4.0	476800	e	3.0	-0.72	5.32 × 10 ⁰⁸	0.455
1582.980	399987	e	4.0	463159	o	4.0	-2.18	1.76 × 10 ⁰⁷	0.307
1589.926	361671	e	0.0	424567	o	1.0	-3.22	1.61 × 10 ⁰⁶	0.297
1592.255	399987	e	4.0	462791	o	3.0	-3.50	8.38 × 10 ⁰⁵	0.005
1594.362	404979	e	3.0	467700	o	3.0	-3.09	2.12 × 10 ⁰⁶	0.070
1602.384	354833	e	1.0	417240	o	2.0	-1.40	1.04 × 10 ⁰⁸	0.426
1611.915	408767	e	1.0	470805	o	1.0	-2.97	2.71 × 10 ⁰⁶	0.689
1624.326	401595	e	5.0	463159	o	4.0	-4.03	2.38 × 10 ⁰⁵	0.001
1629.779	406342	e	2.0	467700	o	3.0	-1.82	3.76 × 10 ⁰⁷	0.334
1666.389	408767	e	1.0	468777	o	0.0	-2.79	3.90 × 10 ⁰⁶	0.766
1678.979	417240	o	2.0	476800	e	3.0	-1.14	1.74 × 10 ⁰⁸	0.376
1695.490	417240	o	2.0	476220	e	2.0	-2.61	5.66 × 10 ⁰⁶	0.026
1702.128	417240	o	2.0	475990	e	1.0	-2.00	2.26 × 10 ⁰⁷	0.182
1718.804	404979	e	3.0	463159	o	4.0	-1.50	7.15 × 10 ⁰⁷	0.351
1729.745	404979	e	3.0	462791	o	3.0	-3.90	2.83 × 10 ⁰⁵	0.007
1732.412	404979	e	3.0	462702	o	2.0	-5.00	2.23 × 10 ⁰⁴	0.007
1771.511	406342	e	2.0	462791	o	3.0	-1.65	4.79 × 10 ⁰⁷	0.340
1774.308	406342	e	2.0	462702	o	2.0	-3.42	7.95 × 10 ⁰⁵	0.027
1779.708	354833	e	1.0	411022	o	1.0	-1.15	1.49 × 10 ⁰⁸	0.529
1780.976	411551	e	4.0	467700	o	3.0	-2.09	1.79 × 10 ⁰⁷	0.014
1783.421	382356	e	3.0	438428	o	3.0	-3.95	2.32 × 10 ⁰⁵	0.001
1832.677	386811	e	2.0	441376	o	1.0	-4.46	6.80 × 10 ⁰⁴	0.000
1836.615	416357	e	2.0	470805	o	1.0	-1.87	2.60 × 10 ⁰⁷	0.426
1854.084	408767	e	1.0	462702	o	2.0	-1.79	3.14 × 10 ⁰⁷	0.345
1859.704	423028	o	3.0	476800	e	3.0	-2.36	8.54 × 10 ⁰⁶	0.158

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
1868.670	354833	e	1.0	408347	o	2.0	0.20	3.01 × 10 ⁰⁹	0.754
1879.982	423028	o	3.0	476220	e	2.0	-1.89	2.44 × 10 ⁰⁷	0.223
1886.579	385422	e	3.0	438428	o	3.0	-3.80	2.84 × 10 ⁰⁵	0.001
1887.897	354833	e	1.0	407802	o	1.0	-0.64	4.27 × 10 ⁰⁸	0.695
1913.656	386172	e	4.0	438428	o	3.0	-2.21	1.10 × 10 ⁰⁷	0.016
1930.427	424188	o	0.0	475990	e	1.0	-2.24	1.02 × 10 ⁰⁷	0.136
1935.996	424567	o	1.0	476220	e	2.0	-1.91	2.21 × 10 ⁰⁷	0.125
1937.346	386811	e	2.0	438428	o	3.0	-2.34	7.78 × 10 ⁰⁶	0.055
1937.684	411551	e	4.0	463159	o	4.0	-3.40	7.32 × 10 ⁰⁵	0.190
1939.262	425234	o	2.0	476800	e	3.0	-1.50	5.62 × 10 ⁰⁷	0.192
1944.655	424567	o	1.0	475990	e	1.0	-2.21	1.08 × 10 ⁰⁷	0.136
1947.685	416357	e	2.0	467700	o	3.0	-0.67	3.67 × 10 ⁰⁸	0.389
1951.600	411551	e	4.0	462791	o	3.0	-3.80	2.89 × 10 ⁰⁵	0.013
1961.323	425234	o	2.0	476220	e	2.0	-2.02	1.67 × 10 ⁰⁷	0.170
1970.210	425234	o	2.0	475990	e	1.0	-3.95	1.90 × 10 ⁰⁵	0.010
2010.815	354833	e	1.0	404548	o	2.0	-0.31	8.05 × 10 ⁰⁸	0.773
2025.649	361671	e	0.0	411022	o	1.0	-1.18	1.08 × 10 ⁰⁸	0.535
2152.917	416357	e	2.0	462791	o	3.0	-2.67	3.00 × 10 ⁰⁶	0.207
2157.052	416357	e	2.0	462702	o	2.0	-3.06	1.21 × 10 ⁰⁶	0.396
2167.060	361671	e	0.0	407802	o	1.0	-0.20	9.02 × 10 ⁰⁸	0.556
2170.400	354833	e	1.0	400893	o	1.0	-0.08	1.20 × 10 ⁰⁹	0.786
2181.151	354833	e	1.0	400666	o	0.0	-0.44	5.04 × 10 ⁰⁸	0.764
2315.068	236100	e	2.0	279282	o	3.0	-0.89	1.61 × 10 ⁰⁸	0.700
2331.483	382356	e	3.0	425234	o	2.0	-3.23	7.35 × 10 ⁰⁵	0.007
2457.950	382356	e	3.0	423028	o	3.0	-2.90	1.42 × 10 ⁰⁶	0.027
2474.439	398027	e	3.0	438428	o	3.0	-3.37	4.41 × 10 ⁰⁵	0.005
2511.049	385422	e	3.0	425234	o	2.0	-2.23	6.21 × 10 ⁰⁶	0.012
2548.824	361671	e	0.0	400893	o	1.0	-0.71	2.01 × 10 ⁰⁸	0.600
2566.032	354833	e	1.0	393792	o	2.0	-3.29	5.20 × 10 ⁰⁵	0.693
2600.612	399987	e	4.0	438428	o	3.0	-2.06	8.33 × 10 ⁰⁶	0.151
2601.830	386811	e	2.0	425234	o	2.0	-3.30	4.85 × 10 ⁰⁵	0.005
2605.289	438428	o	3.0	476800	e	3.0	-3.89	1.32 × 10 ⁰⁵	0.048
2638.015	234685	e	1.0	272581	o	2.0	-5.95	1.07 × 10 ⁰³	0.870
2645.275	438428	o	3.0	476220	e	2.0	-1.81	1.53 × 10 ⁰⁷	0.413
2647.797	386811	e	2.0	424567	o	1.0	-2.41	3.60 × 10 ⁰⁶	0.019
2658.359	385422	e	3.0	423028	o	3.0	-3.31	4.56 × 10 ⁰⁵	0.002
2712.458	386172	e	4.0	423028	o	3.0	-1.20	5.74 × 10 ⁰⁷	0.116
2723.098	236100	e	2.0	272812	o	3.0	-3.47	3.00 × 10 ⁰⁵	0.651
2740.342	236100	e	2.0	272581	o	2.0	-6.66	1.95 × 10 ⁰²	0.011
2760.319	386811	e	2.0	423028	o	3.0	-3.84	1.25 × 10 ⁰⁵	0.005
2853.532	406342	e	2.0	441376	o	1.0	-2.79	1.34 × 10 ⁰⁶	0.013
2859.490	272581	o	2.0	307542	e	2.0	-4.55	2.28 × 10 ⁰⁴	0.031
2865.802	382356	e	3.0	417240	o	2.0	-2.31	4.04 × 10 ⁰⁶	0.020
2869.092	441376	o	1.0	476220	e	2.0	-3.55	2.27 × 10 ⁰⁵	0.056
2878.510	272812	o	3.0	307542	e	2.0	-3.03	7.53 × 10 ⁰⁵	0.116
2888.157	441376	o	1.0	475990	e	1.0	-4.45	2.78 × 10 ⁰⁴	0.017
2988.754	404979	e	3.0	438428	o	3.0	-2.25	3.99 × 10 ⁰⁶	0.113
3065.747	408767	e	1.0	441376	o	1.0	-3.69	1.45 × 10 ⁰⁵	0.017
3115.720	406342	e	2.0	438428	o	3.0	-3.51	2.02 × 10 ⁰⁵	0.008
3141.965	385422	e	3.0	417240	o	2.0	-1.50	2.11 × 10 ⁰⁷	0.065
3285.392	386811	e	2.0	417240	o	2.0	-2.01	6.00 × 10 ⁰⁶	0.073
3309.100	382356	e	3.0	412567	o	4.0	-4.87	8.21 × 10 ⁰³	0.004
3537.559	279282	o	3.0	307542	e	2.0	-1.04	4.86 × 10 ⁰⁷	0.144
3644.738	251853	e	2.0	279282	o	3.0	-1.28	2.66 × 10 ⁰⁷	0.644
3674.478	398027	e	3.0	425234	o	2.0	-2.13	3.67 × 10 ⁰⁶	0.065

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
3682.871	385422	e	3.0	412567	o	4.0	-3.48	1.60×10^{05}	0.016
3719.595	411551	e	4.0	438428	o	3.0	-0.48	1.64×10^{08}	0.433
3787.521	386172	e	4.0	412567	o	4.0	-4.32	2.25×10^{04}	0.001
3846.395	382356	e	3.0	408347	o	2.0	-2.55	1.31×10^{06}	0.042
3995.832	416357	e	2.0	441376	o	1.0	-0.91	4.96×10^{07}	0.275
3998.709	398027	e	3.0	423028	o	3.0	-1.85	5.87×10^{06}	0.247
4129.189	386811	e	2.0	411022	o	1.0	-0.93	4.51×10^{07}	0.479
4338.869	399987	e	4.0	423028	o	3.0	-0.68	7.44×10^{07}	0.578
4360.824	385422	e	3.0	408347	o	2.0	-1.17	2.32×10^{07}	0.808
4430.398	393792	o	2.0	416357	e	2.0	-2.61	8.78×10^{05}	0.056
4504.865	382356	e	3.0	404548	o	2.0	-2.89	4.44×10^{05}	0.010
4529.562	416357	e	2.0	438428	o	3.0	-2.02	2.77×10^{06}	0.043
4642.088	386811	e	2.0	408347	o	2.0	-2.78	5.00×10^{05}	0.079
4762.615	386811	e	2.0	407802	o	1.0	-1.62	6.85×10^{06}	0.488
4769.886	251853	e	2.0	272812	o	3.0	-3.68	6.28×10^{04}	0.751
4823.044	251853	e	2.0	272581	o	2.0	-5.87	3.94×10^{02}	0.117
4935.675	404979	e	3.0	425234	o	2.0	-0.83	4.08×10^{07}	0.456
5203.360	398027	e	3.0	417240	o	2.0	-0.86	3.40×10^{07}	0.693
5227.029	385422	e	3.0	404548	o	2.0	-0.91	3.00×10^{07}	0.572
5245.955	382356	e	3.0	401413	o	3.0	-2.00	2.51×10^{06}	0.236
5291.773	406342	e	2.0	425234	o	2.0	-1.30	1.18×10^{07}	0.465
5485.444	406342	e	2.0	424567	o	1.0	-1.10	1.70×10^{07}	0.448
5538.935	404979	e	3.0	423028	o	3.0	-1.41	8.37×10^{06}	0.354
5629.385	272581	o	2.0	290340	e	3.0	-3.23	1.25×10^{05}	0.579
5636.367	386811	e	2.0	404548	o	2.0	-2.56	5.71×10^{05}	0.055
5703.575	272812	o	3.0	290340	e	3.0	-1.70	4.07×10^{06}	0.589
5848.042	273245	o	4.0	290340	e	3.0	-0.66	4.30×10^{07}	0.599
5991.388	406342	e	2.0	423028	o	3.0	-2.20	1.15×10^{06}	0.301
6071.071	408767	e	1.0	425234	o	2.0	-2.30	9.07×10^{05}	0.498
6197.529	272581	o	2.0	288712	e	2.0	-1.74	3.21×10^{06}	0.596
6251.788	385422	e	3.0	401413	o	3.0	-2.41	6.49×10^{05}	0.064
6287.569	272812	o	3.0	288712	e	2.0	-0.85	2.38×10^{07}	0.600
6327.364	408767	e	1.0	424567	o	1.0	-1.43	6.13×10^{06}	0.604
6464.845	400893	o	1.0	416357	e	2.0	-2.10	1.32×10^{06}	0.311
6482.872	408767	e	1.0	424188	o	0.0	-1.42	5.98×10^{06}	0.689
6559.437	386172	e	4.0	401413	o	3.0	-0.68	3.32×10^{07}	0.809
6581.027	272581	o	2.0	287772	e	1.0	-1.03	1.43×10^{07}	0.609
6675.953	393792	o	2.0	408767	e	1.0	-2.97	1.68×10^{05}	0.131
6689.802	401413	o	3.0	416357	e	2.0	-2.94	1.83×10^{05}	0.088
6846.488	386811	e	2.0	401413	o	3.0	-3.30	6.77×10^{04}	0.037
6875.682	398027	e	3.0	412567	o	4.0	-3.25	7.55×10^{04}	0.218
7091.249	462702	o	2.0	476800	e	3.0	-2.51	4.28×10^{05}	0.816
7099.307	386811	e	2.0	400893	o	1.0	-3.43	4.78×10^{04}	0.053
7136.301	462791	o	3.0	476800	e	3.0	-0.98	1.42×10^{07}	0.827
7157.760	475990	e	1.0	489957	o	1.0	-4.62	3.27×10^{03}	0.005
7277.604	476220	e	2.0	489957	o	1.0	-3.34	5.77×10^{04}	0.044
7328.822	463159	o	4.0	476800	e	3.0	0.08	1.53×10^{08}	0.838
7395.507	462702	o	2.0	476220	e	2.0	-1.00	1.24×10^{07}	0.830
7444.520	462791	o	3.0	476220	e	2.0	-0.11	9.37×10^{07}	0.830
7523.515	462702	o	2.0	475990	e	1.0	-0.28	5.96×10^{07}	0.836
7946.939	399987	e	4.0	412567	o	4.0	-1.51	3.23×10^{06}	0.593
7965.936	393792	o	2.0	406342	e	2.0	-3.40	4.45×10^{04}	0.020
8153.700	404979	e	3.0	417240	o	2.0	-1.69	2.06×10^{06}	0.136
8465.791	404548	o	2.0	416357	e	2.0	-2.21	6.17×10^{05}	0.126
8710.686	411551	e	4.0	423028	o	3.0	-2.52	3.14×10^{05}	0.041

Table B.7. continued.

Wavelength ^a / Å	Lower level			Upper level			log <i>gf</i>	<i>gA</i> / s ⁻¹	CF
	Energy ^b / cm ⁻¹	Parity	<i>J</i>	Energy ^b / cm ⁻¹	Parity	<i>J</i>			
8741.915	382356	e	3.0	393792	o	2.0	-0.86	1.24×10^{07}	0.902
8936.493	393792	o	2.0	404979	e	3.0	-4.12	6.62×10^{03}	0.005
9040.745	279282	o	3.0	290340	e	3.0	-4.58	2.14×10^{03}	0.202
9111.608	401595	e	5.0	412567	o	4.0	-0.61	2.06×10^{07}	0.941
9173.478	406342	e	2.0	417240	o	2.0	-2.60	1.96×10^{05}	0.041
9687.265	398027	e	3.0	408347	o	2.0	-2.18	4.57×10^{05}	0.219
9861.174	401413	o	3.0	411551	e	4.0	-2.34	2.59×10^{05}	0.092
10584.712	475990	e	1.0	485435	o	2.0	-4.77	1.06×10^{03}	0.019
10601.549	279282	o	3.0	288712	e	2.0	-4.87	8.05×10^{02}	0.006
10848.900	476220	e	2.0	485435	o	2.0	-3.76	9.76×10^{03}	0.021
10986.002	467700	o	3.0	476800	e	3.0	-5.54	1.65×10^{02}	0.064
11261.983	416357	e	2.0	425234	o	2.0	-2.48	1.56×10^{05}	0.230
11577.606	476800	e	3.0	485435	o	2.0	-3.40	1.86×10^{04}	0.013
11685.872	407802	o	1.0	416357	e	2.0	-1.75	9.64×10^{05}	0.347
11733.877	467700	o	3.0	476220	e	2.0	-2.21	2.99×10^{05}	0.611
11798.965	408767	e	1.0	417240	o	2.0	-3.41	1.88×10^{04}	0.067
11944.162	385422	e	3.0	393792	o	2.0	-2.85	6.12×10^{04}	0.037
12176.935	416357	e	2.0	424567	o	1.0	-3.12	2.94×10^{04}	0.051
12340.778	400666	o	0.0	408767	e	1.0	-3.54	1.35×10^{04}	0.087
12480.979	408347	o	2.0	416357	e	2.0	-2.66	1.07×10^{05}	0.135
12696.552	400893	o	1.0	408767	e	1.0	-3.80	6.44×10^{03}	0.061
13175.100	404979	e	3.0	412567	o	4.0	-2.63	8.28×10^{04}	0.261
13860.067	468777	o	0.0	475990	e	1.0	-3.20	2.02×10^{04}	0.059
14320.680	386811	e	2.0	393792	o	2.0	-2.29	1.46×10^{05}	0.274
14986.160	416357	e	2.0	423028	o	3.0	-4.25	1.45×10^{03}	0.007
15330.882	398027	e	3.0	404548	o	2.0	-2.21	1.73×10^{05}	0.130
18346.981	400893	o	1.0	406342	e	2.0	-3.17	1.36×10^{04}	0.103
18462.179	470805	o	1.0	476220	e	2.0	-3.52	6.25×10^{03}	0.020
18739.025	411022	o	1.0	416357	e	2.0	-2.83	3.26×10^{04}	0.041
19281.138	470805	o	1.0	475990	e	1.0	-3.51	5.17×10^{03}	0.053
20288.092	401413	o	3.0	406342	e	2.0	-3.29	9.03×10^{03}	0.069
21367.522	406342	e	2.0	411022	o	1.0	-2.79	2.30×10^{04}	0.042
23612.751	393792	o	2.0	398027	e	3.0	-2.53	4.12×10^{04}	0.062
23702.300	404548	o	2.0	408767	e	1.0	-4.61	2.84×10^{02}	0.013
28042.626	401413	o	3.0	404979	e	3.0	-4.51	2.82×10^{02}	0.004
29533.374	398027	e	3.0	401413	o	3.0	-2.51	2.10×10^{04}	0.289
29691.212	404979	e	3.0	408347	o	2.0	-3.50	2.25×10^{03}	0.032
44345.899	408767	e	1.0	411022	o	1.0	-6.29	1.74×10^{00}	0.000
49875.313	406342	e	2.0	408347	o	2.0	-3.67	4.80×10^{02}	0.097
55741.362	404548	o	2.0	406342	e	2.0	-3.82	3.28×10^{02}	0.021
68493.153	406342	e	2.0	407802	o	1.0	-3.53	3.47×10^{02}	0.084
70126.230	399987	e	4.0	401413	o	3.0	-2.35	6.61×10^{03}	0.211
98425.200	411551	e	4.0	412567	o	4.0	-5.59	5.28×10^{00}	0.003
103626.947	407802	o	1.0	408767	e	1.0	-5.66	1.55×10^{00}	0.004
113250.287	416357	e	2.0	417240	o	2.0	-3.46	4.69×10^{01}	0.181
232018.570	404548	o	2.0	404979	e	3.0	-4.56	2.52×10^{00}	0.007
238095.246	408347	o	2.0	408767	e	1.0	-5.35	8.38×10^{01}	0.069

Notes. ^(a) All wavelengths (given in vacuum for $\lambda < 2000$ Å, air for $2000 \text{ Å} \leq \lambda \leq 20000$ Å, vacuum for $20000 \text{ Å} < \lambda$) are deduced from experimental energy levels. ^(b) Experimental energy levels taken from Saloman (2004) and Biémont et al. (2007).